

# DEVELOPMENT OF STANDARDS FOR UNDERGRADUATE COMMUNITY PHYSIOTHERAPY EDUCATION IN SOUTH AFRICA

BY

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Submitted in partial fulfilment of the requirements for the degree

**PhD (Physiotherapy) in the Faculty of Health Sciences**

**University of Pretoria**

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# DECLARATION OF ORIGINALITY

I declare that the thesis, 'Development of standards for undergraduate community physiotherapy education in South Africa', which I hereby submit for the degree PhD (Physiotherapy) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

3 March 2013

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**SIGNATURE**

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**DATE**

**KARIEN MOSTERT-WENTZEL**

# DEDICATION

To my companion, Lars;  
and to Grysmeerkatmeisie,  
the two horsemen,  
and like-minded friends

for humility, inspiration, intellectual stimulation  
and  
sharing the awe of life, beauty and the splendour of creation

*Education*  
*is the most powerful weapon*  
*which you can use to change the world*

Nelson Mandela

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# SUMMARY

## Development of Standards for Undergraduate Community Physiotherapy in South Africa

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**Introduction:** Education of physiotherapists still fails to meet the health and social needs of society. One instrument to steer change in health sciences education is a re-designed curriculum.

The overall intent of this study was to develop standards of competencies, teaching and learning strategies, and assessment, for an undergraduate community physiotherapy curriculum in South Africa.

The grounding for this research was pragmatism. The Six-step model for curriculum development and the Clinical Prevention and Population Health Curriculum framework guided the research process and main analysis.

**Methods:** A sequential mixed method design was used. First, a two-phase parallel situation analysis was conducted which included a qualitative document analysis of community

physiotherapy curricula of the eight physiotherapy university departments in South Africa and a review of health policy documents. The experience of 12 purposively selected physiotherapists who had completed a compulsory community service year was qualitatively explored through interviews within an appreciative inquiry stance.

In phase 2, input was gained from physiotherapists, from all ecological levels, on the community physiotherapy curriculum through a Delphi study. Three rounds were used. Round 1 explored the roles of physiotherapy in community health, round 2 quantified consensus in overarching competency domains, and round 3 gathered learning and teaching, and assessment, strategies to gain these competencies.

**Results:** All eight universities had gaps in their community physiotherapy curriculum and were variedly aligned with South African health policies and health profile. Graduates need to be able to provide physiotherapy over the lifespan, to conditions mirroring the quadruple burden of disease, in settings varying from hospitals to homes of clients, with emphasis on health education and promotion within an interprofessional team. They must be prepared for suboptimal practice environments and to utilise the compulsory community service year as a gateway in professional development. Graduates need resilience to cope during the year and awareness about the importance of identifying a mentor in the frequent absence of a profession-specific supervisor.

Community physiotherapy needs three core knowledge and skill sets; i.e. clinical physiotherapy, population health and community development. Consensus of 70%+ was gained on competency criteria in the domains of the following professional roles: clinician, professional, communicator and collaborator, scholar, health promoter, public health practitioner, community developer (change agent), and manager/leader.

Service-learning was identified as a strategy to develop these roles supported by learning and assessment portfolios. Reflection in different formats – essays, presentations, case analysis, projects such as community wellness programmes, diaries - is a core activity to facilitate learning. A range of complementary strategies were suggested that included direct observation, role-play, and journal clubs. Core to assessment for professional competencies



is for the students to be able to give evidence of their own learning (e.g. in a portfolio or oral examination) and to get frequent formative feedback.

**Conclusion.** The physiotherapy profession is important for improving the health status of the South African population. Physiotherapy students should be educated to take on relevant professional roles through the application of appropriate educational standards. The study recommends that the curriculum standards be implemented and evaluated and that the application of complex theory in the further development and implementation of the curriculum be investigated. Lastly, future research in the generic professional domains, such as public health and community development, should be interprofessional in nature.

**Keywords**

community, competence/y, content analysis, Delphi study, health sciences education, mixed methods research, physiotherapy, population health, public health

# OPSOMMING

## Die Ontwikkeling van Standaarde vir Voorgraadse Gemeenskapsfisioterapie in Suid-Afrika

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<b>Graad</b>	PhD (Fisioterapie)

**Inleiding:** Opvoeding van fisioterapeute vervul steeds nie die gesondheids- en sosiale behoeftes van die samelewing nie. Een instrument om verandering in gesondheidswetenskapsopleiding te bestuur, is 'n herontwerpte kurrikulum.

Die oorkoepelende voorneme van die studie was om standarde te ontwikkel vir bekwaamhede, onderrig-en-leer strategieë en assessering vir 'n voorgraadse gemeenskapsfisioterapie kurrikulum in Suid-Afrika.

Die grondslag vir die navorsing was pragmatisme. Die Ses-stap model vir kurrikulum-ontwikkeling en die Kliniese Voorkoming en Populasie Gesondheid kurriulumraamwerk het die navorsingsproses en die hoofanalise gerig.

**Metodes:** 'n Opeenvolgende gemengde-metodes navorsingsontwerp is gebruik. Eerstens is 'n twee-fase parallelle situasie-ontleding gedoen wat 'n kwalitatiewe dokument-ontleding van gemeenskapsfisioterapie kurrikula van agt fisioterapie universiteitsdepartemente, en 'n oorsig van gesondheidsbeleidsdokumente ingesluit het. Die ondervinding van 12 doel-geselekteerde fisioterapeute wat 'n jaar van verpligte gemeenskapsdiens gedoen het, is

kwatitatief evalueer deur middel van onderhoude volgens 'n waarderende ondersoek benadering.

In fase 2 is insette van fisioterapeute van alle ekologiese vlakke oor die gemeenskaps-fisioterapie kurrikulum ingewin deur middel van 'n Delphi studie. Drie rondtes is gebruik. Rondte 1 het die rolle van fisioterapie in gemeenskapsgesondheid ondersoek, rondte 2 het konsensus in oorkoepelende bekwaamheidsdomeine kwantifiseer, en rondte 3 het onderrig-en-leer- en assesseringstrategieë ingewin.

**Resultate:** Al agt universiteite het leemtes in hul gemeenskapsfisioterapie kurrikula gehad en was wisselend belyn met die Suid-Afrikaanse gesondheidsbeleidsomgewing en -gesondheidsprofiel. Gegradueerdes moet fisioterapie oor die lewensloop kan voorsien, vir toestande wat die viervoudige las van siektes aanspreek, diens van hospitaalopset tot huise van kliënte kan verskaf met beklemtoning van gesondheidsopvoeding en -bevordering binne 'n interprofessionele span. Hulle moet voorbereid wees vir suboptimale praktykomgewings en die verpligte gemeenskapsjaar gebruik as 'n deurgang tot professionele ontwikkeling. Gegradueerdes benodig veerkragtigheid om die jaar te hanteer en bewustheid oor die belang daarvan om 'n mentor te identifiseer in die afwesigheid van 'n professie-spesifieke toesighouer.

Gemeenskapsfisioterapie benodig drie kern kennis- en vaardighedsstelle, nl. kliniese fisioterapie, openbare gesondheid en gemeenskapsontwikkeling. Konsensus van 70%+ is behaal in die bekwaamheidskriteria in domeine van die volgende professionele rolle: klinikus, professionele rol, kommunikeerder en samewerker, geleerde, gesondheidsbevorderaar, openbare gesondheidspraktisyn, gemeenskapsontwikkelaar (agent van verandering) en bestuurder/leier.

Diensleer is geïdentifiseer as 'n strategie om hierdie rolle te ontwikkel, ondersteun deur leer-en-assesseringsportefeuljes. Refleksie in verskillende formate – essays, voordragte, gevalanalise, projekte soos gemeenskapswelstandsprogramme, dagboeke – is 'n kernaktiwiteit om leer te fasiliteer. 'n Reeks komplementêre strategieë is voorgestel, wat insluit direkte waarneming, rolspel en joernaalklubs. Sentraal tot die assessering van professionele bekwaamhede is dat studente in staat moet wees om bewys te lewer van hul

die leer (byvoorbeeld in 'n portefeulje of mondelinge eksamen) en om gereelde vormende terugvoer te ontvang.

**Gevolgtrekking.** Die fisioterapie professie is belangrik om die gesondheidstatus van die Suid-Afrikaanse samewling te verbeter. Fisioterapiestudente behoort opgevoed te word vir die geïdentifiseerde rolle deur die toepassing van toepaslike opvoedkundige standaarde. Die studie beveel aan dat die kurrikulumstandaarde geïmplementeer en evalueer word, en dat die toepassing van kompleksiteitsteorie in die verdere ontwikkeling en implementering van die kurrikulum ondersoek word. Laastens behoort toekomstige navorsing in die generiese professionele domeine, soos openbare gesondheid en gemeenskapsontwikkeling, interprofessioneel van aard te wees.

### **Sleutelwoorde**

Fisioterapie, Delphi studie, gemeenskap, gesondheids-wetenskaplike/-professionele opvoeding, inhoudsanalise, openbare gesondheid.

# PUBLICATIONS AND PRESENTATIONS IN SUPPORT OF THIS THESIS

## PUBLICATIONS

Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. 2013. Status of undergraduate community-based and public-health physiotherapy education in South Africa. *South African Journal of Physiotherapy*, 69(1),26-35.

Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. A model for community physiotherapy from the perspective of newly graduated physiotherapists as a guide to curriculum revision. *African Journal of Health Professions Education*. *African Journal of Health Professions Educations*, 5(1),19-25.

## MANUSCRIPTS

Mostert-Wentzel, K. The Kaleidoscope Competency Framework for undergraduate community and public health physiotherapy. A Delphi study. *Physiotherapy Theory and Practice*.

Mostert-Wentzel, K., van Rooijen A.J. & Frantz J. Educational strategies for professional competencies for undergraduate physiotherapy community and public health physiotherapy. *BMC Medical Education*.

## PUBLICATION (NOT SUBSIDY CARRYING)

Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. 2011. Conceptualising community physiotherapy as a point of departure for curriculum review in undergraduate physiotherapy education in South Africa. *World Confederation of Physical Therapy Conference*, 20 – 23 June 2011, Amsterdam, the Netherlands [Abstract]. *Physiotherapy*, 97(S1),S840-1.

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Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. 2011. Conceptualising community physiotherapy as a point of departure for curriculum review in undergraduate physiotherapy education in South Africa. World Confederation for Physical Therapy Congress, 20 – 23 June 2011, Amsterdam, the Netherlands.

Mostert-Wentzel, K., van der Walt, M., Redivo, V., Essa, F., Eloff, N., Bredenhann, M., et al. 2009. Developing into a healthcare professional: Does current education fit the real world of compulsory community service by physiotherapists in South Africa? Third International Conference on Medical Education, 28 October to 6 November 2009, Khartoum, the Sudan.

## PRESENTATIONS

Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. 2012. “Were we not trained to do physiotherapy?” Competencies for community and public health physiotherapy in South Africa: A Delphi study. Paper presented at the South African Society of Physiotherapy Congress, 20 – 23 March 2012, Bloemfontein, Republic of South Africa (RSA).

Mostert-Wentzel, K. & Frantz, J. 2009. Learning outcomes for community physiotherapy in South Africa. Paper presented at the Southern African Association of Health Educationalists (SAAHE) Conference, 2 – 4 July 2009, Cape Town, RSA.

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# LIST OF ABBREVIATIONS AND ACRONYMS

5 MTW	5-Metre Timed Walk Test
6 MWT	6-Minute Walk Test
10 MTW	10-Minute Timed Walk Test
ACGME	Accreditation Council for Graduate Medical Education, USA
ADL	Activities of Daily Living
AFPT	Aggregated Functional Performance Time
AIDS	Acquired Immunodeficiency Syndrome
ABCS	Activities-specific Confidence Balance Scale
ATE	Aerobic Training Exercise
BADL	Basic Activities of Daily Living
BECCI	Behavior Change Counseling Index
BI	Barthel Index
BMD	Bone Mineral Density
BMI	Body Mass index
CBR	Community-based rehabilitation
CHE	Council on Higher Education, RSA
CBL	Case-based Learning
CBO	Community-based Organisation
CI	Confidence Interval
COPD	Chronic Obstructive Pulmonary Disease
CORE	Client-orientated Research and Evaluation
CRDQ	Chronic Respiratory Disease Questionnaire
CSP	Chartered Society of Physiotherapy
DPO	Disabled People Organisation
EQ-5D	EuroQual Health-related Quality of Life Instrument

FES	Functional Electrical Stimulation
FBO	Faith-based Organisations
EBPH	Evidence Based Public Health
EDSS	Extended Disability Status score
ESCAPE	Enabling Self-management and Coping with Arthritic Knee Pain through Exercise Programme
FAIMER	Foundation for the Advancement of International Medical Education and Research
FAST	Frenchay Aphasia Screening Test
FSQ	Functional Status Questionnaire
FTP	Physiotherapy (“Fisioterapie”) <sup>1</sup>
GHQ	General Health Questionnaire
GMC	General Medical Council, United Kingdom
HAD	Hospital Anxiety and Depression Scale
HIV	Human Immunodeficiency Virus
HPCSA	Health Professions Council of South Africa
HRQoL	Health-related Quality of Life
IADL	Instrumental activity of daily living
ICF	International Classification of Functioning, Disability and Health
ITER	In-training Evaluation Report
IPT	Interprofessional Team
MCQ	Multiple Choice Question
MDT	Multidisciplinary Team
MMSE	Mini-Mental State Examination
MRC	Medical Research Council
MS	Microsoft
MSF	Multiple Source Feedback
MSH	Management Sciences for Health

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<sup>1</sup> Module in the Physiotherapy Programme, University of Pretoria.

MSIS	Multiple Sclerosis Impact Scale
NDoH	National Department of Health
NGO	Non-governmental Organisation
NHP	Nottingham Health Profile
NHS	National Health System
NQF	National Qualifications Framework
OSCE	Objective Structured Clinical Examination
PAAF	Patients Admission and Assessment Form
POL	Development and Leadership (“Professionele Ontwikkeling en Leierskap”) (a module in the 2012 UP curriculum)
PPT	Physical Performance Test
QoL	Quality of Life
RoM	Range of Motion
RSA	Republic of South Africa
RTE	Resistance Training Exercise
RoM	Range of Motion
RSA	Republic of South Africa
SAFRI	Sub-Saharan African FAIMER Regional Institute
SAQ	Short Answer Question
SAQA	South African Qualifications Authority
SASP	South African Society for Physiotherapy
SF-36	Short Form 36
SGB	Standard Generating Body
SP	Simulated Patient
STREAM	Stroke Rehabilitation Assessment of Movement
TB	Tuberculosis
UK	United Kingdom
USA	United States of America
USAID	United States Agency for International Development
VO <sub>2</sub> max	Maximum Oxygen Consumption
WCPT	World Confederation for Physical Therapy

WHO World Health Organization

WHOQOL-BREF: World Health Organization Quality of Life Measure – Abbreviated  
Version

WOMAC Western Ontario and McMaster Universities Osteoarthritis Index

## 1. ORIENTATION TO THE RESEARCH

*Education is a social process. Education is growth.  
Education is not preparation for life; education is life itself.*

John Dewey

### INTRODUCTION

Despite the more-than-a-century-old call for relevant health sciences education (Flexner 1990/1910: 1017-1036), an on-going debate is that the education of healthcare practitioners still fails to meet the health and social needs of society (Sullivan and Rosin 2008; Bhutta et al. 2010; Frenk et al. 2010). One instrument for steering change in health sciences education is a re-designed curriculum (Grant 2006; Albanese et al. 2008; Andre and Barnes 2010). The call for transformation of curricula is a worldwide phenomenon and applies to different healthcare professions (Drain et al. 2007; Dalley, Candela and Benzel-Lindley 2008; Hagopian et al. 2008; Andre and Barnes 2010). Included in this curriculum transformation drive are allied health professions and, specifically, physiotherapy (Frantz 2009; Ramklass 2010). The standard curriculum contains the standards of an education programme (South African Qualifications Authority 2005b; South African Qualifications Authority 2005c). These standards prescribe, among others, the competencies that have to be acquired, the topics to be dealt with, the strategies for teaching and learning, and the scheduling of themes and activities over the duration of the study programme. Importantly, standards also include the assessment criteria, as 'assessment drives learning' (South African Qualifications Authority 2005a).

Three areas that receive increasing attention in the health sciences curriculum discourse are academic service learning (community-based education/community engagement), population/public health in the undergraduate curriculum, and the hidden curriculum (Sundelin 2005; Zenzano et al. 2011; Khan 2013). With academic service learning, students gain academic credits while addressing real needs in communities and reciprocally learning from the communities they serve (Bender et al. 2006). With the realisation of the extent to which social variables impact on health, traditional clinical disciplines alone are understood



to be not enough to complete the armoury of the health sciences graduate. Knowledge and skills in population health need to complement the traditional clinically based curriculum (Zenzano et al. 2011). The 'hidden curriculum' refers to important skills that students gain through curriculum activities, but which have not been described categorically in the curriculum (Karnieli-Miller et al. 2011). The hidden curriculum includes, for example, cultural competence and communication skills.

On the basis of the necessity for continuous curriculum reform and the importance of academic service learning, population health and previously neglected elements of the curriculum highlighted above, this study was undertaken to revise the standards of undergraduate community physiotherapy education in South Africa.

## BACKGROUND TO THE STUDY

As with other institutions in South Africa, the curriculum of the Department of Physiotherapy at the University of Pretoria has attempted to keep in line with shifts in the international and national health and education environment. In the 1990s a course that focuses on professional development and leadership was introduced accompanied by community-based education. From humble beginnings these modules and the community-based placement improved from superficial coverage to become one of the flagstone areas in the University of Pretoria physiotherapy curriculum (HPCSA accreditation visit 2012).

Still, despite overall positive course evaluations, the perception persisted among students and even some staff members that community physiotherapy and professional development were unnecessary add-ons to the clinical core of the curriculum (Department of Physiotherapy 2000 till 2008). In addition, against the trend in health education research, the stakeholders of the curriculum had not been involved in its development (personal communication with Dr CA Eksteen, Dr J Mothabeng and Prof. AJ van Rooijen, Departmental Curriculum Committee). Stakeholders include physiotherapy clinicians, rehabilitation managers and physiotherapy academics. As students and newly qualified physiotherapists have valuable information about their own learning needs to contribute to identifying problems in the curriculum, it is a limitation that they were not consulted during the previous curriculum revision in the Department of Physiotherapy.

Internationally a call for curriculum designers to obtain input from partners when revising curricula is heard (Kiguli-Malwadde et al. 2006; Barber, Boote and Cooper 2007; Hoat and Wright 2008; Abdullah et al. 2009; Muller et al. 2008; Keogh et al. 2010). Novices, as an important stakeholder group, tend to hold completely different perspectives from experts (Morcke et al. 2006). These different perspectives need to be integrated into a new curriculum (Kamaka 2010). These perspectives are important as they reflect the grass-roots needs of clinicians, including newly qualified physiotherapists, as well as that of the clients of the physiotherapy service provided by graduates from the university.

In addition, how the University of Pretoria community physiotherapy curriculum compared to those of other educational institutions in South Africa was not clear. Other questions that remained were: What are the education priorities in community physiotherapy from the perspective of the stakeholders working in the field? What are the best practices in teaching and assessing community physiotherapy? How should community physiotherapy topics be scheduled in the curriculum?

Attempts to answer these questions in other settings were found. International education bodies have developed curriculum and competency frameworks, which emphasised new roles for the healthcare professional, apart from the role of clinician, to transform healthcare through better teaching and learning, assessment and self-assessment of healthcare professionals (Brown 2007; Frank et al. 2010a; Frank et al. 2010b). The CanMEDS framework is a widely utilised meta-cognitive framework that describes eight professional physician roles, which included the medical expert, communicator, collaborator, manager, health advocate, scholar and professional (Frank 2005). The CanMEDS framework was developed by the initiative of the Royal College of Physicians and Surgeons of Canada to meet the needs of society and is therefore a needs-driven competency framework (Frank and Danoff 2007). Nationally in the Republic of South Africa (RSA), the Medical Board of the Health Professions Council of South Africa (HPCSA) has adopted the CanMEDS framework for South African medical educational institutions. The University of Stellenbosch Faculty of Health Sciences has approved the CanMEDS framework for implementation by all its departments, which include physiotherapy. However, taking differences between the professions into account, one may assume that allied health professions, such as

occupational therapy and physiotherapy, may have different or additional roles to fulfil compared to medical doctors. Both these allied health professions, for example, are active partners in community-based rehabilitation programmes and act as agents to facilitate the re-integration of people with disabilities into society (National Department of Health 2000; 2002a; Bury 2005; World Health Organization (WHO)/International Federation of Anti-Leprosy Associations 2007; Wakerman and Humphreys 2011).

The World Confederation for Physical Therapy (WCPT) today recognises community physiotherapy as part of undergraduate education (World Confederation for Physical Therapy 2011a; 2011c; 2011c). However, prior to this move, the WCPT – through investigations of regional working groups, which included Africa and its member organisation South Africa – identified that most physiotherapy institutions continued to emphasise musculoskeletal conditions in the training they provided up to at least 2007 (Dean 2007). Following these investigations, at the next WCPT World Conference in Amsterdam in 2011, the focus shifted towards health promotion practice as a priority physical therapy clinical competency in the 21<sup>st</sup> century. As part of this conference, attendees of the second Global Health Forum for Physiotherapy worked on action-plan ideas across ecological levels (i.e. practice, education, research, professional organisations, and government) for task forces within and between WCPT regions.

At the time the current study began, the standards for undergraduate education of the Board for Physiotherapy, Podiatry and Biokinetics, of the HPCSA, only briefly referred to ‘community practice’ (Health Professions Council of South Africa 2003). In contrast, the document described clinical practice to the level of specific modalities, such as interferential electrotherapy. The time was ripe to investigate the community physiotherapy curriculum in South Africa empirically. The healthcare status of the world and South African society demanded expansion of the traditional clinically based curriculum to a curriculum that also addressed non-clinical areas such as health education and promotion, especially in community-based settings.

The South African population, which includes those in poverty, increasingly lives with chronic diseases – such as long-term stroke, diabetes and asthma – and episodically

disabling conditions – such as controlled AIDS (Myezwa 2010). Indeed, South African society has suffered from a quadruple burden of disease. This burden includes (1) communicable diseases, such as HIV and AIDS and tuberculosis; (2) other communicable diseases such as malaria and conditions related to mother and child health; (3) trauma and injuries; and (4) chronic diseases of lifestyle (Groenewald et al. 2012). Many clients that live with these conditions need services outside of hospitals. In addition, lifestyle-related risk factors for disease have been increasing (Beaglehole et al. 2011). In addition to clinical treatment, healthy living, therapeutic exercise and physical activity can help prevent these risk factors (World Health Organization 2008a; 2008b; Magnusson 2009; World Health Organization 2009; Ryan et al. 2010). Physiotherapists are particularly knowledgeable about these elements (Frantz 2005; Shirley, van Der Ploeg and Bauman 2010). However, the relatively low number of physiotherapists compared to the population implies that they will work with other levels of healthcare team members.

To address these issues, the relative under provision of healthcare staff worldwide impelled the idea of skills shifts to cadres of health workers such as mid-level and community-based workers (World Health Organization 2006a). In South Africa, the National Department of Health (NDoH) has estimated that the relative under provision of physiotherapists will continue and also stresses working with community-health workers (National Department of Health 2005c; 2011b; Gilson, Palmer and Schneider 2005; Schneider, Hlophe and van Rensburg 2008). This increase in importance of community and lay workers and in the number of volunteers that work with the healthcare sector demands new capabilities from professional health workers (Schneider et al. 2008; National Department of Health 2012a). Do undergraduate curricula sufficiently prepare physiotherapists for less hands-on work and more capacity building of physiotherapy assistants and community workers? These skills are of particular importance as the proposed district healthcare teams do not include allied health professionals (Barron and Pillay 2011; Community Media Trust 2011).

An appeal that physiotherapy graduates act out their social responsibility towards client aggregates, such as those with disabilities, is pressing (Fourie 2008; Mostert-Wentzel et al. 2012a). Although progress has been made with providing healthcare for people with disabilities – they can, for example, access free health services up to the age of six – as a

group these people remain vulnerable. They form an important target group for physiotherapy interventions, such as reintegrating them into society (National Department of Health 2003; Kendall, Muenchberger and Catalano 2009).

Drawing on nursing literature and experience a definition of community physiotherapy was developed by the author (Helvie 1998; Allender and Spradley 2005; Nies and McEwen 2007; Clarke 2008). (See Box 1.1.)

**Box 1.1. Definition of community physiotherapy**

Community physiotherapy covers comprehensive healthcare, with the overarching aim of protecting and promoting health and wellness of human communities. The primary responsibility of the community physiotherapist is to the population, although services are also directed to groups, families and individual clients. A population or community can be a geographical area, such as a health district, or a group of clients, e.g. all those with disabilities in a province.

Community physiotherapy takes place in the health sector and in other settings such as schools and industry.

In community-based rehabilitation projects physiotherapists contribute to healthcare, e.g. through health promotion, prevention of disability, medical care, rehabilitation and the provision of assistive devices such as wheelchairs. In addition, they facilitate, in partnership, empowerment of persons with disabilities, e.g. through social mobilisation and working with self-help groups and disabled people organisations (DPOs).

Education about health is an essential component of community physiotherapy to promote self-responsibility by addressing risk factors of lifestyle diseases. For example, the lack of physical activity is a contributing factor in common conditions and/or their complications, such as HIV/AIDS, stroke, cardiovascular disease, cancer and depression. As exercise experts, physiotherapists, for example, initiate exercise classes in a variety of settings, such as at luncheon clubs, to promote a physically active lifestyle.

A community physiotherapist combines the theory and practice of physiotherapy, public health and community development.

The body of knowledge that supports non-hospital interventions such as domiciliary programmes is growing. Evidence exists about the effectiveness, efficacy, feasibility and affordability of these programmes. Appraisal of the studies using the Cochrane tool is set out in Appendix A. Summaries of the studies with a description of the participants, intervention, comparison intervention, outcome measures and results are presented in tables in Appendix B. Table 1.1 on the next page shows the quality of the evidence<sup>2</sup>

In Table 1.1 green blocks indicate low risk of bias and orange blocks high risk of bias. Question marks mean the risk of bias is unclear, usually owing to gaps in reporting on procedures. Adoption of standards like the Concord by researchers would contribute to better reporting of research processes and outcomes. Owing to the nature of physiotherapy, blinding of patients and personnel is seldom possible and therefore only two studies do not have a high risk of performance bias. As trial registers become more accessible so will the ability to detect publication bias increase where all outcome measures set out to be measured according to the research protocol are not reported on with the final findings.

This evidence should be part of the community physiotherapy curriculum (Michelotti et al. 2004; Keays et al. 2006; Genêt et al. 2007; Sizer et al. 2007; Cassidy and Cote 2008; Maleka et al. 2008; Shilton et al. 2008; Whitehead 2008; Ziden, Frandin and Kreuter 2008; Bassett and Prapavessis 2009; Johansson et al. 2009a; Aitken et al. 2010; Grant 2010; Mangione et al. 2010; Orpen and Harris 2010; Thomas et al. 2010; Hesse 2011).

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<sup>2</sup> The citations include, in addition to the primary studies, studies that report on the primary studies' methodology and long-term follow-up results.

Table 1.1. Risk of different types of bias by study

Study	Selection bias <sup>a</sup>	Selection bias <sup>b</sup>	Performance bias <sup>c</sup>	Detection bias <sup>d</sup> (patient-reported)	Detection bias <sup>e</sup> (objective)	Attrition bias <sup>f</sup> (short term)	Attrition bias <sup>f</sup> (longer term)	Reporting bias <sup>g</sup>
Barrett 2002	-	-	-	-	-	-	n/a	?
Beech 1999	-	-	+	+	-	-	-	?
Barnett 2003	-	-	+	-	n/a	n/a	-	-
Brach 2003	?	?	+	?	n/a	n/a	-	+
Burch 1999	-	-	+	+	n/a	-	-	-
Ciaschini 2009	-	?	+	+	n/a	-	n/a	?
Gill 2002, 2004	?	?	+	-	n/a	-	-	-
Gitlin 2006, 2009	?	-	+	-	-	-	-	?
Grant 2005	?	-	+	-	-	-	-	-
Green 2002	-	-	+	+	n/a	n/a	-	?
Irvine 2010	-	-	+	-	-	-	-	?
Jessep 2009	-	-	+	-	-	-	-	-
Kuisma 2002	-	-	+	-	n/a	-	+	?
Lin 2004	?	?	-	-	n/a	n/a	-	?
Lord 2008	-	-	+	-	n/a	-	+	?
Luukinen 2007	-	?	+	?	n/a	n/a	n/a	?
Mitchell 2005	-	-	+	?	-	n/a	-	?
Moffett 2004	-	-	+	-	n/a	n/a	-	?
Munneke 2010	-	?	+	-	n/a	n/a	-	?
O'Shea 2007	-	-	+	-	n/a	n/a	-	?
Pang 2005	-	-	+	-	-	n/a	-	?
Young 1992	+	-	+	-	n/a	-	-	-

<sup>a</sup> Random sequence generation; <sup>b</sup> Allocation concealment; <sup>c</sup> Blinding of participants and personnel; <sup>d</sup> Blinding of outcome assessment; <sup>e</sup> Blinding of outcome assessment; <sup>f</sup> Incomplete outcome data addressed; <sup>g</sup> Selective reporting

Citations: Kriska et al. 1986; Young and Forster 1991a; Young and Forster 1991b; 1992; Young and Forster 1993; Rudd et al. 1997; Pereira et al. 1998; Beech et al. 1999; Burch et al. 1999; Wolfe, Tilling and Rudd 2000; Gill et al. 2001; Barrett and Smerdely 2002; Kuisma 2002; Gill et al. 2002; Green et al. 2002; Barnett et al. 2003; Brach et al. 2003; Gill et al. 2003; Gill et al. 2004; Green et al. 2004; Lin et al. 2004; Grant et al. 2005; Mitchell et al. 2005; Moffett et al. 2005; Pang et al. 2005; Gitlin et al. 2006; Masud et al. 2006; Luukinen et al. 2007; O'Shea, Taylor and Paratz 2007; Gitlin et al. 2008; Lord et al. 2008; Ciaschini et al. 2009; Gitlin et al. 2009; Jessep et al. 2009; Grant 2010; Irvine et al. 2010; Keus et al. 2010; Munneke et al. 2010.

## STATE OF EXISTING RESEARCH

A variety of professions has developed competency frameworks for the broader role of different levels of healthcare professionals. Physiotherapy-specific frameworks have also been developed. However, in researching these frameworks published accounts were found to be available only from developed countries like Australia, New Zealand, Canada, the United States of America, Europe and the United Kingdom. Documents found had been published mainly on institutional websites, and were not readily available in published scientific literature. (Broberg et al. 2003; Pharmaceutical Society of Australia 2003; Jacques 2004; Allan et al. 2005; Frank 2005; Odawara 2005; Mckean et al. 2006; Oppewal, Lamanna and Lee Glenn 2006; Ratima, Waetford and Wikaire 2006; Brown 2007; Drain et al. 2007; Marshall et al. 2007; Calhoun et al. 2008; Mezey et al. 2008; Polivka et al. 2008; Accreditation Council for Canadian Physiotherapy Academic Programs et al. 2009; Barry et al. 2009; Faarvang and Da Silva 2009; Forrest et al. 2009; Gunn and Goding 2009; Lin et al. 2009; Battat et al. 2010; National Physiotherapy Advice Committee 2010; Pillay 2010; Chartered Society of Physiotherapy c.2012).

While scholarly work in physiotherapy curriculum development remained scarce, literature in the field of community physiotherapy and service learning appeared to be only emerging. The two frameworks for physiotherapy curriculum development found are not explicit with regard to physiotherapy in public health or in community development and/or community engagement (Broberg et al. 2003; Darrah et al. 2006). On the other hand, employers in Australia “expressed the need for graduates to have further education in fields such as paediatrics, disability management, rural physiotherapy, community physiotherapy and physiotherapy in the schools sector” (McKeenen 2005: iii). However, published physiotherapy curriculum studies in the developing world could not be found, apart from isolated studies from South Africa (Futter 2003; Krause et al. 2006; Ramklass 2009b).

Furthermore, the role of the community physiotherapist was not established satisfactorily (Edwards and Richardson 2008: 184,191) and other community physiotherapy studies were found to be outdated (Stewart and Salmon 1994; Wallner and Stewart 1994; Mpofu 1995; Mpofu 2000). Without a conceptual framework of the discipline or field, no sound



foundation for the development of standards of education as part of curriculum development exists.

#### STATEMENT OF THE PROBLEM

Despite attempts to keep the undergraduate community physiotherapy curriculum abreast with changes in the healthcare and education environment, the extent to which the undergraduate physiotherapy curriculum of the University of Pretoria was still fit for purpose at the time this study began, was unclear. In addition, improvements to the community physiotherapy curriculum happened in a haphazard way and in relative isolation. The department did not establish how the curriculum compared to other South African physiotherapy educational institutions. Furthermore, the department had developed the previous physiotherapy curriculum without input from stakeholders such as physiotherapy clinicians. In fact, clinicians mainly ignored the section on community physiotherapy in a questionnaire developed to test perspectives for the previous curriculum (personal communication with the then chairperson of the Departmental Curriculum Committee, Dr Carina Eksteen). The community physiotherapy curriculum lacked a coherent structure and was organised along *ad hoc* time allocated on the traditional timetable.

#### PURPOSE OF THE STUDY

The overall intent of this study was to develop standards of competencies, teaching and learning, and assessment for an undergraduate community physiotherapy curriculum. The study was conducted in three phases. The purpose of the first phase was to carry out a situation analysis of community physiotherapy education in South Africa. This meant first comparing the undergraduate physiotherapy curricula of the eight university physiotherapy education departments in South Africa through a document analysis of community physiotherapy curricula. The second intention of Phase 1 was to explore the experiences of newly graduated physiotherapists of a compulsory community service year. These findings were to be used to develop a model as the basis for curriculum development in community physiotherapy.

The second phase of the study was designed to gain input from physiotherapists, from all ecological levels, on the community physiotherapy curriculum through a consensus-building technique, a Delphi study. The purpose of the first round of the Delphi was to explore how panellists viewed the concept 'community physiotherapy' and how they defined the role of physiotherapy in community settings. The second round aimed to establish consensus on programme-level core competencies for community physiotherapy in eight overarching competency domains and to verify their applicability to the University of Pretoria curriculum.

The intention of the third round was to explore and describe teaching and learning, and assessment strategies. During the third and final phase of the research, the inquirer aimed to integrate findings from the Delphi, with literature findings, to make suggestions for a meso-curriculum for community physiotherapy. The study concludes with recommendations for practice and research.

#### RESEARCH OBJECTIVES

The objectives of this study were:

1. To conduct a situation analysis of the context of community physiotherapy.
2. To clarify the expectations of stakeholders about the standards for undergraduate community physiotherapy education.
3. To develop standards of education for undergraduate community physiotherapy.

#### SIGNIFICANCE OF THE RESEARCH

By clarifying the role of the physiotherapist in community health, the community physiotherapy model provides an original synthesis of the elements of this field of physiotherapy. The collaborative development of competencies, teaching and learning strategies, and assessment strategies in the field of community physiotherapy, with systematic input by stakeholders from different ecological levels, has also not been undertaken before (Hart 1998: 99). The findings of the study strengthen the body of knowledge of physiotherapy. The study focuses specifically on the fields of community

physiotherapy, professional development (Phase 1) and physiotherapy curriculum design, particularly programme-level competencies (Phase 2). The study provides a coherent framework for further theory development. These two theoretical constructs, the model and the framework, have potential for use by different stakeholders.

First, the competency model gives structure for the development of a meso-curriculum. The curriculum for the first year, suggested in the study, forms the basis for implementation in 2013 at the University of Pretoria Physiotherapy Programme (2012). The number of notional hours for community physiotherapy and professional development increased from 50 to 251. Micro-curricula for the third and fourth years will follow incrementally. Physiotherapy departments in South African institutions may use the framework similarly. The head of department of another South African physiotherapy institution in South Africa has voiced an interest in using the curriculum. Physiotherapy educational institutions from other middle-income countries with similar health systems may also find the framework useful.

Second, the inquirer presented the competency framework to the South African Society of Physiotherapy (SASP) during a meeting of the Education Portfolio in 2010 (Mostert-Wentzel 2011). Owing to input from other universities as well, the latest draft Standards for Education for Physiotherapy in South Africa includes more in-depth information about community physiotherapy, public health in physiotherapy and social-behavioural standards than the 2003 document (Health Professions Council of South Africa 2003).

Third, the framework offers a structure for assessing students in clinical practice, not only on the community placements. The framework provides overarching professional roles relevant to other clinical areas as well.

Fourth, the community physiotherapy model functions as a guide for self-learning for physiotherapy undergraduate students, in preparation for their first jobs as qualified physiotherapists: serving a year of compulsory community physiotherapy in the public sector. The model informs undergraduate students about physiotherapy elements *per se*, but also about the practice environment that they will have to deal with. The model also highlights the key role of personal development.

Fifth, in addition to curriculum and syllabus development, the model and framework form a conceptual framework for educators to use in planning and implementing teaching and learning, and assessment strategies, based on input from a panel knowledgeable about the practice of physiotherapy in the 'real world' combined with suggestions from best international practices from literature.

Six, both the model and the framework can serve to help students and qualified physiotherapy clinicians alike to identify competencies where self-development must take place. Similarly, the SASP and organisers of continuous professional development courses may find the framework useful when planning professional development programmes (Ahuja 2011).

Finally, the curriculum provides the potential for relevantly trained physiotherapy graduates to contribute meaningfully to the improvement of the health status and quality of life of the South African population.

## RESEARCH DESIGN

A sequential mixed method design (Creswell 2009: 10,11) was appropriate for addressing the problem stated above. Figure 1.1 presents the research process. The figure follows the conventions for the diagrammatic depiction of mixed method studies developed by Creswell (2009). The blocks 'qual' refer to research steps that utilise qualitative data or methods and 'quan' to steps that utilise quantitative data or methods.

Each pair of blocks in Phase 2 in Figure 1.1 represents one round of the Delphi. Round 1 tested a conceptual definition of community physiotherapy and asked panellists through open-ended questions to describe the ideal role of physiotherapists in community settings. Phase 1 and Delphi round-1 findings were used to develop the questionnaire for round 2. This questionnaire comprised lists of performance competencies in eight domains. For each performance competency, panellists had to indicate their level of agreement on a Likert scale. In this way numeral data was generated and was subsequently analysed quantitatively to identify core performance competencies. Performance competencies that

## CHAPTER 1. Orientation

scored 70%+ remained in the final core competency framework. In Delphi round 3 panellists contributed optimal education and assessment strategies for each domain.

The suggestions for elements of a meso-curriculum for community physiotherapy (Phase 3) combine the findings from rounds 2 and 3, supported by the literature.

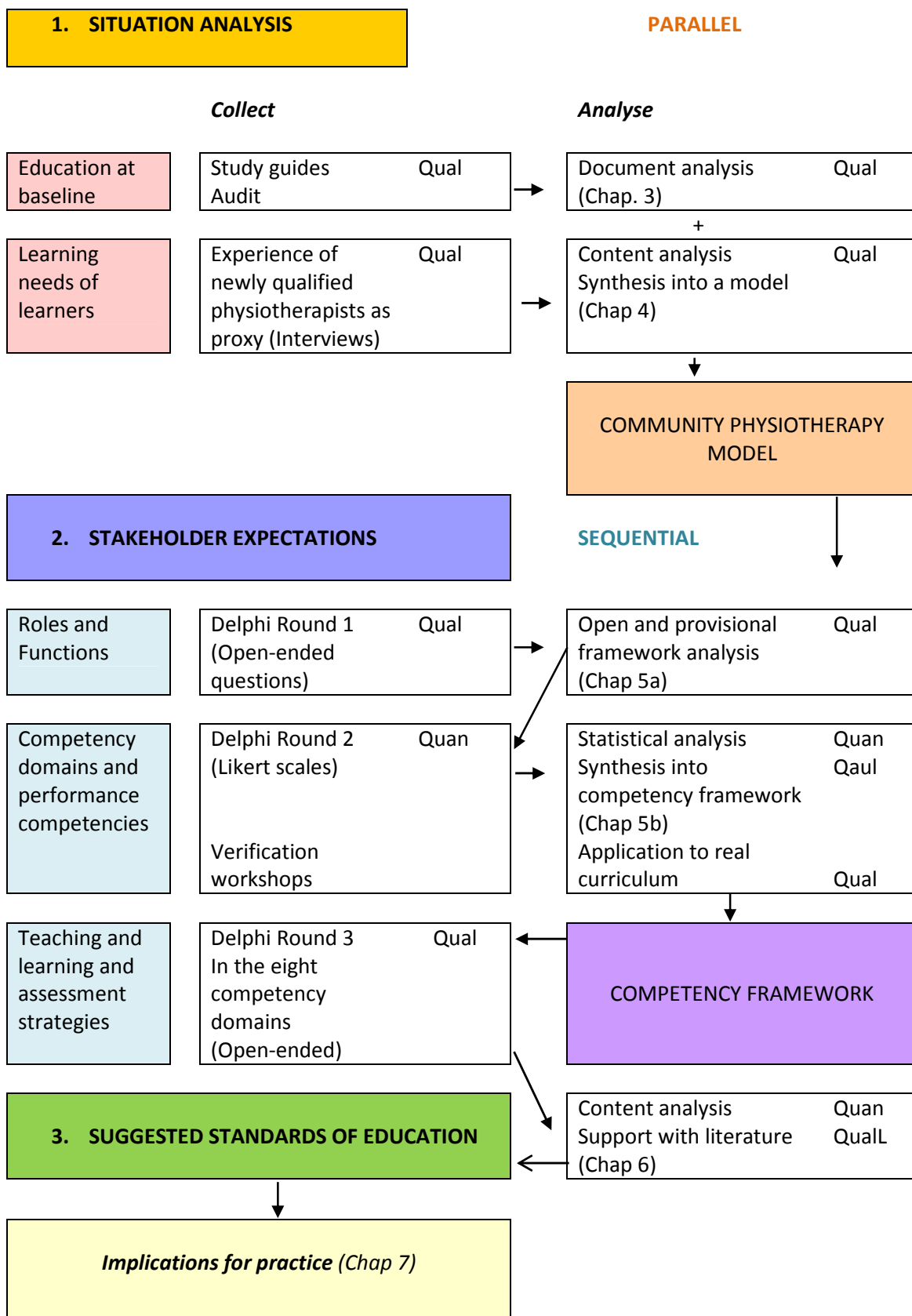


Figure 1.1. Flow diagram of the research

## DELIMITATIONS OF THE RESEARCH

The term 'curriculum', which originates from the Latin word for 'track' or 'race course', guides the delivery and evaluation of a learning programme. This study is limited to the standards as defined in the section 'Definition of terms'. These standards are competencies/learning outcomes at programme level and suggested education and assessment strategies. The developed curriculum does not have enough detail to be of use to administrators and course coordinators, apart from providing insight into the organising framework of the curriculum. Syllabi for individual study units were, for example, not developed. Other elements of a curriculum document not dealt with in this research are the administration and coordination of assessment opportunities, logistics around clinical placements and financing of the implementation of the community physiotherapy curriculum (Kern 1998: 59-62). To address the competencies for community physiotherapy, learning opportunities cannot be limited to one course, but the programme as a whole must deal with the standards recommended in this thesis.

## CONCEPTUAL FRAMEWORK AND THEORETICAL ASSUMPTIONS

Figure 1.2 illustrates the conceptual framework for the research. The grounding for this social research can be found in the pragmatic philosophy of Dewey, James, Pierce, Mead and others (Dewey 1916; Diggins 1994). Pragmatism is therefore the worldview or paradigm that undergirds the research (Plano Clark and Creswell 2008; Greene and Hall 2010). A paradigm is a system of beliefs and practices among the members of a scholarly discipline about which questions are most important and which methods are most appropriate for answering those questions (Kuhn 1996; Bergman 2010).

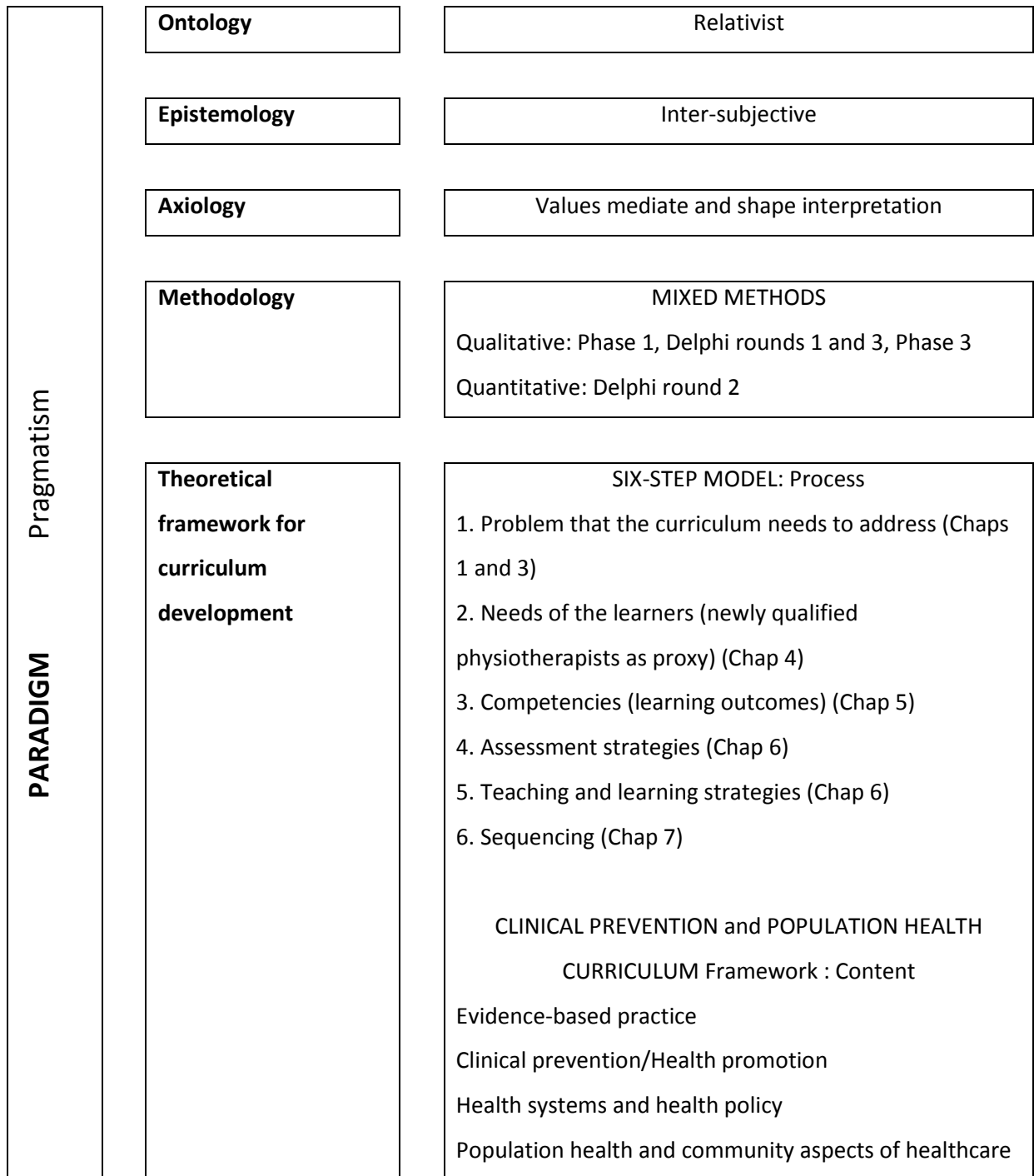


Figure 1.2. Conceptual framework of the study



Pragmatism as a worldview is appropriate because the research problem around the community physiotherapy curriculum originates in the ‘world of every-day life’ (Mouton 2006) and the research seeks a ‘useful’ or ‘workable’ answer for this problem (Morgan 2007; Biesta 2010; Feilzer 2010). Pragmatism emphasises the links between theory and practice (Greenwood and Levin 2005) and values the contribution of diverse stances towards research (Harrits 2011; Vélez Ortiz, Sosulski and Sherwood 2012).

The nature of the solution to a research problem depends on the specific context in a specific time period in history (Giacomini 2010). The central belief of the inquirer is therefore that the search for truth is not absolute, but a search of what ‘works at the time’ (Creswell 2009: 11).

Further assumptions about the following parameters of scientific philosophy are outlined below: ontology, epistemology, axiology, methodology, the rhetorical structure and language, and the theoretical framework.

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## ONTOLOGY

Ontology describes assumptions about the nature of reality and being (Mertens and Wilson 2012). The inquirer assumes multiple realities, from material or physical to social and mental or psychological (Johnson and Onwuegbuzie 2004). Reality and truth depend on the perspective, in the case of the current research, of the participants, panellists and different views in literature. Participants’ history and work experience, to mention two factors, influence how they view the reality of community physiotherapy education.

The reality of the undergraduate community physiotherapy curriculum is constructed in a specific context (South Africa in the early 21<sup>st</sup> century) for a specific purpose and use (training of undergraduate physiotherapy students). The inquirer accepts these different points of view as valid (Henning 2004: 19-21). This view of ontology leans towards constructivism or interpretivism, where participants are seen to co-construct reality through their interpretation of it (Ponterotto 2005; Baxter and Jack 2008).

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## EPISTEMOLOGY

Epistemology is the study of knowledge, the acquisition of knowledge, and the relationship between the research participant (the knower) and the inquirer (would-be knower) (Ponterotto 2005). Epistemology deals with assumptions about what can be known and how to go about such knowing; about the nature of warranted social knowledge (Morgan 2007; Greene 2008). Like Dewey, the inquirer believes that knowledge comes from person-environment interaction, learning through reflecting (Biesta 2010). ‘There are multiple routes to knowledge’ and only ‘warranted assertions’ rather than claims of unvarying truth can be made (Johnson and Gray 2010). ‘The research logic is constituted in the inquiry process itself, and it guides the knowledge generation process’ (Greenwood and Levin 2005).

The researcher, as an insider to the world of curricula, was an active agent in the research, through the formulation of questions in both interviews and questionnaire, during the qualitative analysis of text and in the interpretation. The reflections of both the participants in responding to the research and the researcher, in response to their subjective experiences were incorporated into the input to, the analysis and findings of the research.

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## AXIOLOGY

Axiology deals with the role and place of values in the research process – it is about ethical and moral issues (Morgan 2007). The words used in this section, such as ‘ideal’, show that this is not value-free research. In pragmatism the attempt to gain knowledge in the pursuit of desired ends is important (Morgan 2007: 69; Shaw, Connelly and Zecevic 2010).

The curriculum must fit the expectations of the stakeholders of the specific curriculum and their responses are biased by their experiences and values. The inquirer believes that the curriculum must also be in agreement with the values of the society for which it prepares physiotherapy graduates: a society with great levels of inequity (Uys and Gwele 2005). Values are inherent in the research question, methodology and findings of this study.

## METHODOLOGY

The methodological parameter is about the processes and procedures of the research (Mertens 2012). The methods that were employed in this study were pragmatically selected for the purpose of the research (Plano Clark and Badiee 2010). As a pragmatist the inquirer believes that both qualitative and quantitative research strategies – mixed methods – are valuable, but that the purpose of the research needs to drive the methods (Tashakkori and Teddlie 2010). Refer to Table 1.2 for a comparison within three criteria between the pragmatic, qualitative and quantitative approaches to research methodology. In this study the inductive results from a qualitative approach (interviews in Phase 1b) served as inputs to the deductive goals of a quantitative approach, the survey in the Delphi. In the quantitative phase of the Delphi, open-ended questions provided qualitative information to assist and enrich the interpretation of the quantitative findings.

**Table 1.2. Key issues in social science methodology**

<b>Criteria</b>	<b>Qualitative</b>	<b>Quantitative</b>	<b>Pragmatic</b>
Connection of theory and practice	Induction	Deduction	Abduction
Relationship to the research process	Subjectivity	Objectivity	Inter-subjectivity
Inference from data	Context	Generality	Transference

Source: Morgan (2007)

For example, the inquirer qualitatively collected views of participants, which fitted into a constructivist/interpretivist paradigm. However, she also assumed that the views of panellists could be quantified and that a score, such as that on a Likert scale, could be used to measure these views (van Der Haar and Hosking 2004: 1017-36; Reed 2007: 57-8). The

belief that statistical analysis can assist to measure and determine the level of consensus between the participants about their opinion of the ideal curriculum fits into a post-positivist worldview (Babbie and Mouton 2001: 20-4). Methods from both the qualitative strategies of research inquiry (document analysis, semi-structured interviews, open-ended questions, qualitative text analysis) and quantitative strategies were believed to bring valid information that could be used to develop the community physiotherapy curriculum (Pope 2007).

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#### RHETORICAL STRUCTURE AND LANGUAGE

Although the study has a considerable qualitative slant within its mixed method design, a less personal rhetoric is nevertheless used. The faculty guidelines for dissertations and theses prohibit the use of 'I, my, we' (Faculty of Health Sciences c 2012: 18). However, when preparing manuscripts for publication, language that is more traditional in qualitative research may be used.

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#### THEORETICAL FRAMEWORK

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##### SIX-STEP MODEL: RESEARCH PROCESS

The Six-step model is a commonly used theoretical framework for curriculum development in medical education. The Six-step model has been used in dentistry, nursing and physiotherapy (Fried and Leao 2007; Ferguson, Brownlee and Webster 2008). The model is based on the assumption that educators have a moral obligation to meet the needs of students but, more importantly, the needs of society (Kern, Thomas and Hughes 2009).

The Six-step model is a prescriptive model, similar to the classical Tyler model (Prideaux 2003). The six steps of the Six-step model are: (1) problem identification and general needs assessment, (2) needs assessment of targeted learners, (3) formulation of goals and specific measurable objectives, (4) educational strategies, (5) implementation and (6) evaluation and feedback. The steps do not necessarily follow stepwise from each other, but rather form a dynamic, interactive, on-going process. Figure 1.2 indicates how the first four of these steps were applied in this research.

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## CLINICAL PREVENTION AND POPULATION HEALTH FRAMEWORK: CURRICULUM CONTENT

The Healthy People Curriculum Task Force, which represents seven clinical health professions in the United States of America, developed a curriculum for population health for undergraduate training in different professions during 2004 (Riegelman, Evans and Garr 2004). The framework comprises four domains: (1) evidence-based practice, (2) clinical prevention/health promotion, (3) health systems and health policy and (4) population health and community aspects of healthcare (Allan et al. 2005). This Clinical Prevention and Population Health Curriculum Framework (CPPHCF) formed the conceptual framework for the initial analyses.

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## ETHICAL CONSIDERATIONS

Different phases of the research received separate approval from the Ethics Committee, Faculty of Health Sciences, University of Pretoria, and heads of the eight university departments of physiotherapy gave approval for submission of the study guides for the study guide audit via e-mail. In the other phases, participants gave informed consent in their personal capacity.

To reassure participants about the credentials of the research team, official letterheads of the University of Pretoria were used. All participants and panellists were aware that participation was voluntary, that their identities would be kept confidential, and that they would not be compensated for participation. The information sheet covers elements like the topic of the study, the potential benefit to the participants and society, how the inquirer planned to collect data and approximately how much of their time the interview or other procedures would take. Information about where to contact the research team was provided (Christians 2005; Polit and Beck 2006).

To protect anonymity no personally identifiable information was collected. Data sets contained no identifiable information of participants. Personally identifiable documentation was stored in password-protected files. Documentation, which included the original proposal, will be stored for 15 years following the study, in accordance with the guidelines of the Ethics committee, Faculty of Health Sciences, University of Pretoria.

Data was managed and reported without ‘suppressing, falsifying or inventing findings to meet inquirers’ or audiences’ needs’ (Creswell 2009: 92). Findings are reported with a description of the research design, so that readers can come to their own conclusions about the credibility of the study.

## DEFINITION OF KEY TERMS

### COMPETENCY

The terms ‘competence’ and ‘competency’ can be used interchangeably and mean ‘to be suitable or sufficient for a purpose’ (2001). ‘Competent performance expectations reflect the requisite knowledge, skills, and abilities expected throughout a [health professional’s] career’ (Canadian Association of Occupational Therapists 2007: 7).

Core competencies are ‘[a] set of knowledge, skills and attitudes for the broad practice of ... health’ (Oppewal et al. 2006: 99).

### STANDARDS OF EDUCATION

A standard is defined as the:

- Registered statements of desired education and training outcomes; and
- Their associated assessment criteria, which describe the quality of the expected performance.

The purpose of a standard is to provide guidance to the:

- *Assessor* as to the evidence that must be gathered during assessment;
- *Learner* as to the learning outcomes that must be achieved; and
- *Provider* as to the learning materials or learning experiences to be prepared to assist learners in reaching competence.

## STRUCTURE OF THE THESIS

The layout of this thesis is as follows:

- Chapter 1: Orientation to the research
- Chapter 2: Methodology
- Chapter 3: Situation analysis
- Chapter 4: Community physiotherapy model
- Chapter 5: Competency framework
- Chapter 6: Educational and assessment strategies
- Chapter 7: Conclusions and recommendations

## SUMMARY

Despite the fact that the professional development and community physiotherapy education at the Department of Physiotherapy were of high standard, the informal view of this part of the curriculum, strengthened by negative attitudes of some academic staff members, was unfavourable. Modules had been developed in isolation and how these compared nationally was unclear. Literature around community physiotherapy and especially the undergraduate curriculum was scant.

Objectives to address this problem were set and research objectives agreed on. A mixed methods sequential research design was proposed in three phases: a situation analysis, clarification of the expectations of stakeholders of the curriculum and, finally, development of standards for the undergraduate community physiotherapy curriculum.

The limitations and the envisioned contribution of the research, the pragmatic worldview that guided the research and the inquirer's assumptions in this regard were explained. The research process, planned in accordance with the Six-step Curriculum Development model of Kerns, was outlined. The Clinical Prevention and Population Health Curriculum Framework, which was the springboard for the content of the research, was also detailed.

The chapter concluded with definitions of key terms and the layout of the thesis. The methodology is discussed in more detail in Chapter 2.

## 2. METHODOLOGY

*Faith in the possibilities of continued and rigorous inquiry  
does not limit access to truth to any channel or scheme of things.*

John Dewey

### INTRODUCTION TO THE EXPLANATION OF THE METHODS

Chapter 1 gave the orientation to the research. In this chapter the research setting, the overall research design and the methods and procedures in the three research phases are discussed. For each phase the research design is introduced, followed by how the design was applied in this study.

### RESEARCH SETTING

Physiotherapy education in South Africa is located at eight university physiotherapy departments: the University of Cape Town, University of the Free State, University of Limpopo (Medunsa campus), University of KwaZulu-Natal, University of Pretoria, the University of the Western Cape, University of Stellenbosch and the University of the Witwatersrand. Apart from Masters and PhD programmes, all eight institutions offer a four-year degree on par with an honours degree. The intake varies between 40 and 70 students per year per institution.

Within the minimum requirements determined by the HPCSA, universities may develop their own curricula. Act 56 of 1976 deals with the scope of practice of physiotherapists and other supplementary health professions (RSA 1976). The HPCSA determines the minimum requirements for the education of physiotherapists through the Board for Physiotherapy, Podiatry and Biokinetics (Health Professions Council of South Africa 2012).

Compulsory community service has been employed globally to improve the recruitment of health staff to rural and remote areas (Grobler et al. 2009). The same worldwide trends in the distribution of healthcare workers have occurred in South Africa. Health workers tend to stay on in the urban centres where they have been trained; they leave the public sector to



open private practices and emigrate to developed countries (Bundred and Levitt 2000; Nigenda and Machado 2000; Filmer, Hammer and Pritchett 2002; Dussault and Dubois 2003; Dussault and Franceschini services 2006; Lehmann and Sanders 2007). In 2000, the National Department of Health (NDoH) instituted a year of compulsory community service for medical doctors, then dentists and, in 2003, for supplementary health professionals.

This compulsory community service is intended to improve access to healthcare for the South African society (National Department of Health 2002b; Reid 2001). Physiotherapy graduates must be ready for these working conditions. Not only do they have to serve the one year of community service but since the inception of compulsory community service more posts have been created for physiotherapists in the public sector, which has broadened the scope of physiotherapy in the country. These services are especially important for the re-engineering of primary healthcare and public health (Barron and Pillay 2011; National Department of Health 2011a).

Physiotherapy in the public service is three tiered, from district level/regional, provincial and national level. Home and community-based interventions take place a district level. Managers at three levels are stakeholders of the physiotherapy curriculum and therefore included in this study as participants for developing standards for community physiotherapy in South Africa.

## RESEARCH DESIGN: MIXED METHODS RESEARCH

### OVERVIEW

Table 2.1 gives an overview of the research by research objective in column 1. The research followed the Six-step Curriculum Development model (Kern 1998; Kern et al. 2009) outlined in column 2, with the relevant research design and the inquiry strategy (qualitative or quantitative) in columns 3 and 4. The last two columns give the population and processes for collecting and analysing data for each step. The overall research design – mixed methods – is described in the next section.

**Table 2.1. Summary of the research objectives, research design and steps of the theoretical model**

Research objectives	Six-step model	Design	Approach	Population	Data collection method and/or analysis	
1. Analysis of the context of community physiotherapy	1a Problem identification and general needs assessment – situation analysis	Document analysis	Qual	Community physiotherapy study guides	Content analysis	
	1b Needs assessment of targeted learners	Appreciative inquiry stance	Qual	Recently qualified physiotherapists (as proxy for learners)	Semi-structured interviews Qualitative thematic analysis Model development	
2. Clarification of the expectations of stakeholders about the standards for undergraduate community physiotherapy education	2. Formulation of learning outcomes/competencies	Delphi study	Round 1 and round 2	Qual Quan	Physiotherapists: - Clinicians (including community service physiotherapists) - Managers - Academics	E-survey (Open-ended questions): Qualitative and content analysis Likert scales and statistics Verification Thematic analysis
	3. Identification of educational strategies		Round 3	Qual		
	4. Identification of assessment strategies		Round 3	Qual		
3. Development of standards of education for undergraduate community physiotherapy	5. Implementation	Development of a meso-curriculum	Qual	Delphi findings and literature	Development of a curriculum framework Sequence themes over the four years of study	

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**DEFINITION, TYPOLOGY AND REVIEW OF EXAMPLES**

Mixed methods research is formally defined as ‘research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study’ to draw on the strengths of both qualitative and quantitative inquiry strategies (Johnson and Onwuegbuzie 2004: 17; Johnson, Onwuegbuzie and Turner 2007; 2007a).

The methodology of mixed methods research can be classified according to three dimensions: (1) The emphasis dimension – whether the qualitative and quantitative strategies have equal status or whether one of the two is dominant; (2) the time dimension – whether qualitative and quantitative strategies are employed concurrently or sequentially; and (3) the mixing dimension – whether mixing is employed partially or fully (Creswell and Plano Clark 2007; Leech and Onwuegbuzie 2009; Morse 2010; Sandelowski et al. 2012).

In planning mixed methods research in physiotherapy, Rauscher and Greenfield (2009) distinguish similarly between three points where decisions about the design need to be taken: (1) the *priority* given to the quantitative and qualitative data and methods, (2) the *sequence of implementation* of methods for data collection, and (3) the phases in which the data and findings will be *integrated* (during the data collection, analyses, or interpretation and results phases, or at a combination of points). Different mixed methods designs follow from different combinations of these domains and decisions (Creswell et al. 2004; Morse et al. 2006; Yin 2006; Creswell and Plano Clark 2007; Tashakkori and Creswell 2007b; 2007a; Leech and Onwuegbuzie 2009; Morse 2010; Nastasi, Hitchcock and Brown 2010; Tashakkori and Teddlie 2010; Creswell and Plano Clark 2011).

Rauscher and Greenfield (2009) advocate the use of mixed methods in physiotherapy, especially when investigating complex issues, such as disability and rehabilitation, where the contextual issues are not yet well understood. These authors give examples where qualitative and quantitative methods and data enrich each other towards better understanding of the complex phenomena. For example, researchers apply the International Classification of Functioning, Health and Disability (ICF) and link participation with personal and environmental facilitating and hindering factors (WHO 2001). Just as mixed methods

can create “a holistic understanding of patient injury and rehabilitation, and contributing to innovative, complex treatment interventions” (Rauscher and Greenfield: 91), the design can be similarly useful for innovative, complex curriculum “interventions” as investigated in the current study. Indeed, a complex research question is often the driver in the decision to use a mixed method design (Hesse-Biber 2010).

Despite the usefulness of mixed methods, few physiotherapy studies using mixed methods have been published (Mengshoel 2012). A reason may be that the qualitative and quantitative phases are often published separately, perhaps because some journals and referees still prefer either quantitative or qualitative research designs (Bryman 2007). Evans, Coon and Ume (2011) speculate that because mixed methods is a relatively new design authors use different terminology, which makes searching for the studies difficult.

Bryman (2007) also identified other barriers to the true integration of quantitative and qualitative designs through interviews with experienced mixed method researchers. One barrier is that some researchers tend to emphasise one of the two paradigms at the expense of the other. Another reason for emphasising one of the two is that one of the two sets of data is more interesting than the other. Often the timelines of the qualitative and quantitative phases do not coincide and one part of the study is finished and published before the other. Furthermore, some researchers may find it difficult to bridge the ontological divide between the two and are more conversant in the methods and analyses of one of the two paradigms. Finally, the lack of exemplars of mixed-methods research was mentioned by Bryman (2007) as a barrier.

However, examples of physiotherapy studies with explicit mixed method designs do exist. In one published physiotherapy research protocol, Schuster et al. (2009) proposed a mixed method design for a randomised controlled trial to compare motor imaging that is integrated into a physiotherapy session with motor imaging that is added to a physiotherapy session. Quantitative methods were chosen for comparing the primary outcome, i.e. the time difference to perform the task from pre- to post intervention. In addition, the researchers proposed an embedded qualitative component to the study. Qualitative interviews with patients would be conducted to gain insight into patients’ experience of

motor imaging and their attitude towards this type of intervention. This study is an example of mixed method research with the purpose of complementarity – to explain the results of analyses more fully.

In the present study interviews were conducted to gain insight into experiences of and attitudes towards compulsory community physiotherapy with the aim of enriching recommendations about standards of community physiotherapy education.

Other authors whose purpose of using mixed methods was complementarity were Shiels et al. (2011) and Johnston and Wainwright (2011), who successfully used qualitative interviews to enrich their quantitative findings, Shiels et al. in a randomised controlled trial and Johnston et al. in a case study. The Shiels et al. (2011) study evaluated a Functional Electrical Stimulation (FES) clinic. The researchers interviewed patients with stroke about their experiences of the clinic. The themes from the interviews supported the positive quantitative impact of the clinic found when they statistically compared gait velocity and cadence. Johnston and Wainwright (2011) in their investigation of the use of cycling with FES in an adult with spastic diplegic cerebral palsy similarly explored the experience of the adult of the cycling intervention, while determining the success of the intervention quantitatively through muscle testing, the Timed “Up and Go” test and the Medical Outcomes Study 36-Item Health Survey Questionnaire.

In addition, the Shiels et al. (2011) study reflected on the implementation of the clinic and how the service could be improved. In the current study, the author also added reflection as a method, to follow the qualitative interviews and the quantitative and qualitative phases of the Delphi. Reflection took place jointly with physiotherapy and education innovation personnel of the Health Faculty and individually as reported in Chapter 7.

Mixed methods research was used in physiotherapy undergraduate education by Davies et al. (2011). These researchers explored the transition from physiotherapy student to interprofessional team member. Mixing in the methods was undertaken through a combination of a focus group and a questionnaire with open (qualitative) and closed (quantitative) sections. The current study, which uses an interview and a Delphi with both

qualitative and quantitative elements, is in agreement with the study conducted by Davies et al. in the sense that the combination of findings informed the research question.

Although the sequential design is the most common in mixed methods research (Bergman 2011), a physiotherapy study similar to the current study that used a sequential design was not found. Further on in this section studies from other disciplines are reviewed. Mixed method studies are most prevalent in applied sciences, such as education, medical sciences including nursing, and evaluation (Creswell, Fetters and Ivankova 2004; O'Cathian, Murphy and Nicholl 2007; Alise and Teddlie 2010; Ivankova and Kawamura 2010; Sammons 2010).

The study by Petros et al. (2012) is a good example of triangulation (Östlund et al. 2011) through the use of a concurrent mixed methods design. Petros et al. used three sets of data to investigate the support needs of older caregivers who supported family members living with AIDS in South Africa. The first set comprised survey data of 205 caregivers, the second was ten case studies from follow-up interviews, and the third data set was from interviews with nine key informants of organisations. Benefits from this approach were “increased comprehensiveness of the results and it enhanced understanding of HIV/AIDS-related caregiving” (p. 275).

The study conducted by Omondi et al. (2012), on the other hand, is an example of a sequential mixed methods design. These authors predicted dietary practice behaviour among type-2 diabetics. Although the qualitative and quantitative phases were carried out and analysed after each other, the findings were integrated. Both quantitative and qualitative data findings pointed towards a good fit with the theory of planned behaviour.

Kington et al. (2011) did not only integrate their findings but iteratively integrated the qualitative and quantitative elements throughout the research process. They investigated good classroom practices and started integrations with the research problem, followed by deciding on the methods and finally analysis and interpretation. Castro et al. (2010) give a useful in-depth technical illustration of how to quantify qualitative data.

In contrast to the integration of findings, Baiocchi-Wagner (2012) used the findings from the qualitative phase to inform the quantitative phase to frame the aging experience in care

facility brochures. In the qualitative phase an emergent thematic analysis of long-term care facility brochures was conducted. These themes were then used for the coding in the subsequent content analysis to determine the generalisability of the data. They therefore used the quantitative results to confirm the qualitative findings.

In response to the literature, this study used a partially mixed sequentially dominant status design (Leech and Onwuegbuzie 2009) as described in Figure 1.1. The study consisted of multiple, sequenced phases where the conduct of the quantitative phase drew on the analysis of the preceding qualitative phase, and fed into the subsequent qualitative phase (Forrester et al. 2008; Bazeley 2009: 205). In this study, qualitative findings were used in building the quantitative instrument used in Delphi round 2, specifically to identify the instrument categories (Creswell et al. 2004; Stewart and Haswell 2007; van Ness, Fried and Gill 2011). Although only one quantitative measure (Delphi round 2) was used, this was a pivotal step, as the consensus on core competencies was reached during this round. Table 2.2 indicates the integration of quantitative and qualitative methodologies. This pragmatic decision about methods to fit the research objectives meant that overall a modest mixed methods research design was used (Tashakkori and Creswell 2007b; Teddlie and Tashakkori 2009).

**Table 2.2. Utilisation of quantitative and qualitative measures in this study**

Way of utilisation	Qualitative	Quantitative
Research question/objective	<p>Objective 1: To conduct a situation analysis of the context of community physiotherapy</p> <p>Objective 2: To clarify the expectations of stakeholders about community physiotherapy undergraduate education</p> <p>Objective 3: To develop standards of education for undergraduate community physiotherapy</p>	<p>Implied in research objective 2: To determine consensus about the core competencies for undergraduate community physiotherapy education using different stakeholder groups</p>
The manner in which the research questions were developed		Pre-planned
Sampling procedures	Purposive	
Data collection procedures	<p>Document analysis (Phase 1a)</p> <p>Interviews (Phase 1b)</p> <p>Conceptual modelling</p> <p>Delphi 1 and 3: Survey with open-ended questions</p> <p>Delphi 1: Content analysis</p> <p>Synthesis of a competency framework and verification of its applicability (Phase 2)</p> <p>Synthesis of a curriculum framework (Phase</p>	<p>Phase 2:</p> <p>Content analysis (quantification element) (Delphi 1 and 3)</p> <p>Delphi 2: Survey with Likert scales</p>
Type of data	Textual	Numerical (Delphi 2)
Data analysis	Thematic	Statistical (Delphi 2)
Conclusions	<p>Emic representation (Phase 3: University of Pretoria curriculum)</p> <p>Subjective</p>	<p>Etic presentation: Consensus on core competencies (Phases 1 and 3)</p> <p>Objective (Delphi 2)</p>



## PURPOSES

A mixed methods research design is applied for various reasons (Hall and Howard 2008; Schifferdecker and Reed 2009; Howe 2012; Petros 2012).

The five broad purposes of mixed methods studies that are frequently cited (Greene, Caracelli and Graham 1989) are as follows (Onwuegbuzie and Leech 2005: 384):

- (a) triangulation (i.e. seeking convergence and corroboration of results from different methods studying the same phenomenon);
- (b) complementarity (i.e. seeking elaboration, enhancement, illustration and clarification of the results from one method with results from the other method);
- (c) development (i.e. using the results from one method to help inform the other method);
- (d) initiation (i.e. discovering paradoxes and contradictions that lead to a re-framing of the research question); and
- (e) expansion (i.e. seeking to expand the breadth and range of inquiry by using different methods for different inquiry components).

Denscombe (2008: 272) synthesises the following broad purposes of mixed methods research from reviews of existing mixed methods research:

- (a) some researchers use mixed methods to improve the accuracy of their data, whereas
- (b) others use mixed methods to produce a more complete picture by combining information from complementary kinds of data or sources. Sometimes
- (c) mixed methods are used as a means of avoiding biases intrinsic to single-method approaches — as a way of compensating specific strengths and weaknesses associated with particular methods. Mixed methods have been
- (d) used as a way of developing the analysis and building on initial findings using contrasting kinds of data or methods. And mixed methods approaches have often been
- (e) used as an aid to sampling with, for example, questionnaires being used to screen potential participants for inclusion in an interview program (Rocco et al. 2003; Bryman 2006; Collins, Onwuegbuzie and Sutton 2006).

The purposes of the research applicable to this study are shown in Table 2.3.

**Table 2.3. Purposes of use of mixed methods in this study**

Purpose of use	Example in this study
Triangulation (i.e. seeking convergence and corroboration of results from different methods that study the same phenomenon)	Interviews with newly qualified physiotherapists (Phase 1b) and open-ended questions (Phase 2: Delphi round 1) were both informative about the nature of community physiotherapy.
Development (i.e. using the results from one method to help inform the other method)	The two methods used for triangulation were used to develop the research instrument for Delphi round 2.  Phase 1 and Phase 2 informed Phase 3.
Expansion (i.e. seeking to expand the breadth and range of inquiry by using different methods for different inquiry components)/produce a more complete picture	The study as a whole

The danger exists that mixed methods can be seen as a ‘quick fix’ in submitting to pressures from administrators who need evidence to justify practice, instead of investigating complex matters in depth using qualitative research (Giddings 2006). Sometimes qualitative and quantitative findings conflict with each other, which may – indeed – emphasise the

complexity of the topic under investigation and give different perspectives of the same reality (Slonim-Nevo and Nevo 2009; Denzin 2012; Flick et al. 2012: 105; Mertens and Hesse-Biber 2012). In addition, mixed methods research, especially sequential designs, are time consuming and may be costly (Yauch and Steudel 2003; Teye 2012).

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### SAMPLING SCHEMES

In mixed methods research various combinations of qualitative and quantitative sampling methods are employed (Onwuegbuzie and Collins 2007). Eliciting qualitative responses in addition to quantitative responses from the same group of field-test participants, as in Delphi rounds 1 and 2, is true mixed research sampling design and is referred to as a 'concurrent design' that uses identical samples (Onwuegbuzie and Collins 2007). The overall sampling scheme was qualitative. (See Table 2.4.)

In the dominant research phase, the Delphi, maximum variation as a sampling scheme was used. With maximum variation sampling, individuals are selected to maximise the range of perspectives investigated in the study. Panellists from different management levels (community, clinic, district, provincial, and national), with different roles (community service physiotherapists, clinicians, managers, and academics) and a variation in work experience (e.g. old age homes, hospitals, non-governmental organisations) were recruited for the study. In the workshops held to test the applicability of the sample, all the academic staff of the Department of Physiotherapy and the education consultants from the Department of Education Innovation, University of Pretoria, were invited to participate.

In Phase 1a the document analysis was an audit that included all the study guides; in other words, sampling was not carried out. In Phase 1b snowball or chain sampling was employed as participants were asked to refer the researchers to other potential participants. The above discussion of the different sampling methods used shows that this study used the most common type of sampling scheme, which is described by Onwuegbuzie and Collins (2007) as non-random sampling, in both the qualitative and quantitative steps of the research.

**Table 2.4. Sampling scheme utilised in this mixed methods study**

	<b>Phase 1a:</b>	<b>Phase 1b:</b>	<b>Phase 2:</b>			<b>Applica-</b>
	<b>Document</b>	<b>Qualitative</b>	<b>Delphi</b>	<b>Delphi</b>	<b>Delphi</b>	<b>bility</b>
	<b>analysis</b>	<b>interviews</b>	<b>Round 1</b>	<b>Round 2</b>	<b>Round 3</b>	<b>work-</b>
						<b>shops</b>
Overall purpose	Designed to generate a sample that will address research questions					
Generalisability	Transferability					
Types of techniques	Purposive					
Rationale for selecting units	n/a	Information-rich participants Different perspectives				
Sample size	8	15	70	110	49	7 + 2
Depth of information per unit	Moderate					
When the sample was selected	Pre-planned	Chain sampling during the phase	Convenience	Pre-planned and	Pre-planned	Purposive
				Chain		
How selection was made	n/a	Judgement	n/a	Judgement		
Sampling frame	Formal	n/a	Formal	Formal and informal		Formal
Form of data generated	Narrative and	Narrative	Narrative	Numeric	Narrative	Narrative
	Numeric					

Yellow-shaded blocks indicate qualitative elements of sampling, and the grey blocks quantitative.

## TRUSTWORTHINESS AND RIGOUR

Guba and Lincoln (1994) call trustworthiness ‘goodness criteria’. When evaluating the quality or ‘goodness’ of a mixed methods study, some authors suggest that the criteria specific to the research approach (qualitative and quantitative) used in that phase of the study should be employed (Sale and Brazil 2004). Others recommend that criteria specifically for mixed methods studies need to be developed (Abowitz and Toole 2009; Onwuegbuzie and Johnson 2006; Dellinger and Leech 2007; Ihantola and Kihn 2011; Leech, Onwuegbuzie and Combs 2011). Table 2.5 contains a framework for evaluating the trustworthiness and rigour of the respective qualitative and quantitative phases of the study (Lincoln and Guba 1985). How these trustworthiness goals were achieved is later explained in the discussion of the methods of each phase.

**Table 2.5. Goals for trustworthiness and rigour**

<b>Goal</b>	<b>Qualitative approach</b>	<b>Quantitative approach</b>
Truth value	Credibility	Validity
Consistency	Dependability	Reliability
Neutrality	Confirmability	Objectivity
Applicability	Transferability	Generality

Source: Lincoln and Guba (1985)

High quality criteria for mixed methods research were applied in this study as follows (Bryman, Becker and Sempik 2008):

- (1) The reason for employing mixed methods was explained in Chapter 1.

- (2) The methods were relevant to the research objectives as shown in Table 2.1.
- (3) The procedures employed in this mixed methods study were transparent and are explained in the next sections.
- (4) Findings were integrated and not left as distinct quantitative and qualitative findings. The findings from the initial qualitative phases fed into the quantitative phase – interview data and answers to open-ended questions were used to build the quantitative survey instrument. Findings from the quantitative phase – consensus on core competencies – were directly integrated into the subsequent qualitative phase, as the competency domains were used as a framework for the curriculum.

Onwuegbuzi and Johnson (2006; 2007; Onwuegbuzie, Johnson and Collins 2011) coined the term ‘legitimation’ for validity in mixed methods research. By validity they mean ‘that a research study, its parts, the conclusions drawn, and the applications based on it can be of high or low quality, or somewhere in between.’

#### PHASE 1A. SITUATION ANALYSIS: COMMUNITY PHYSIOTHERAPY CURRICULA

##### AUDIT AND DOCUMENT ANALYSIS

An audit is a careful, methodological examination or review of a situation, especially to find the effectiveness of something. Document analysis is a type of audit conducted in social research where documents like minutes and reports are scoured to gain a clearer picture of the situation being investigated (Miller and Alvarado 2005; Greenfield et al. 2011). In healthcare and health sciences education, documents varying from medical records to course syllabi have been investigated to determine the prevalence of health conditions. Documents have also been analysed to reveal the state of interventions and programmes and to gain insight into instructional activity. Documents are used to examine trend patterns and consistencies and to evaluate aspects of a course (McDonald et al. 2003; Currie and Hutchison 2005; Mcmeeken 2007; McCluskey and Middleton 2010; Klein et al. 2012; Mak and Mifflin 2012). Limitations of document analysis include that documents might be incomplete or missing and data is restricted to what already exists (Instructional Assessment Resources 2007).

For analysis of documents, three distinctive approaches are possible: (a) the analysis of documents for their content (content analytic); (b) the analysis of documents as commentary (context analytic); and (c) the analysis of documents as actors (context analytic) (Miller and Alvarado 2005: 250).

In this phase of the study, content analysis was applied to the community physiotherapy study guides of the eight university physiotherapy education departments. This analysis was carried out to gain an idea of the situation in community physiotherapy education at the start of the study and to highlight the importance of the study further.

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## CONTENT ANALYSIS

Content analysis is

‘a research tool used to determine the presence of certain words or concepts within texts or sets of texts. Researchers quantify and analyse the presence, meanings and relationships of such words and concepts, then make inferences about the messages within the texts, the writer(s), the audience, and even the culture and time of which these are a part’ (Writing@Csu 2012: screen 1).

This method is ‘a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding’ (Stemler 2001: 137). This type of analysis is time consuming and reductive (Writing@Csu 2012).

Conceptual content analysis involves tallying and quantifying the presence of selected themes (Bowen 2009; Greenfield et al. 2011). Relational content analysis, or semantic analysis, on the other hand, seeks to go beyond the presence of concepts to exploring the relationships between them (Writing@Csu 2012).

Content analysis has been used in different fields: nursing (Downie, Ogilvie and Wichmann 2005; Farrell, Wallis and Evans 2007), nursing education (Latham, Giffard and Pollard 2007; Feng and Tsai 2012), family practice (Svenberg, Wahlqvist and Mattsson 2007), evidence-based practice (Vlayen et al. 2005), health promotion and health promoting school projects

## CHAPTER 2. Methodology

(Turunen, Tossavainen and Vertio 2004; Gadin, Weiner and Ahlgren 2009; Johansson, Weinehall and Emmelin 2009b). Examples of the use of content analysis in physiotherapy can be found in studies about clinical practice (Gard 2007; Thornquist 2008), physiotherapy professional networks (Stevenson, Chadwick and Hunter 2004) and physiotherapy education (O'loughlin, Dal Bello-Haas and Milidonis 2005). Content analysis is also used in studies that aim to identify physiotherapy research priorities (Mothabeng 2003).

Hsieh and Shannon (2005: 1283) describe three approaches to content analysis: conventional content analysis (open coding in an area with little theory), direct content analysis (start with a theoretical framework) and summative content analysis ('with the purpose of understanding the contextual use of the words or content').

In the current research, the study guides were analysed with a combination of conventional and direct approaches. The analysis was direct in the sense that coding was undertaken within broad themes: programme-level learning outcomes, themes/learning outcomes, and educational and assessment strategies. Within these themes conventional open coding subsequently took place. In the case of educational themes, related codes were integrated into categories. The analysis was therefore a combination of deductive and inductive coding (Elo and Kynga 2008).

'Reliability' in content analysis refers to stability (or inter-rater reliability), reproducibility (or inter-rater reliability), accuracy and precision (refinement of categories) (Neuendorf 2002; Krippendorff 2004). The inquirer ensured stability by re-coding the text after a period of time. In cases where she tended to code differently than the first time, the opinion of an independent coder (a critical friend) was sought and consensus negotiated. As only one coder and not a group of coders was involved, reproducibility, where different coders code the same text in the same way, was not relevant. In the absence of a standard or norm, statistical correspondence was not determined. However, owing to the manifest or easily identifiable content of the text, the inquirer is confident that the analysis was conducted accurately (White and Marsh 2006).

The reader can evaluate the validity of the content analysis by comparing the conclusions in Chapter 3 to the identified categories. Categories were well defined and mutually exclusive



as required by the literature (Stemler 2001). As all universities submitted some form of documentation the findings can be generalised to South African physiotherapy education institutions.

## PHASE 1B. SITUATION ANALYSIS: EXPERIENCES OF COMPULSORY COMMUNITY SERVICE

### APPRECIATIVE INQUIRY

Appreciative inquiry is a method developed by David Cooperrider as an alternative for problem-orientated organisational development (Cooperrider and Whitney 1999; Cooperrider 2003; Cooperrider, Whitney and Stavros 2003; Cooperrider and Whitney 2005). Appreciative inquiry 'is a philosophy, a model of change, and a set of tools and techniques that support discovery, dreaming, design, and creation of a vision that inspires people in an organization to move toward a collective destiny' (Keefe and Pesut 2004: 103). An appreciative inquiry is based on success stories that present a hopeful vision for an ideal future (Fry and Frank 2002; Bushe and Kassam 2005; van Oosten 2006; Gonzales and Leroy 2011).

A classical appreciative inquiry method comprises four phases (Moore 2008):

1. Discovery (Inquiry). During this phase the focus is on an appreciation of what exists, 'the best of what has been and what is'.
2. Dream (Imagine). During the second phase the emphasis is on imagining what could be; this involves the creation of a new vision for the future (Stefaniak 2007).
3. Design (Innovate). The third phase focuses on what should be by co-constructing how it could be and what is possible (Richer, Ritchie and Marchionni 2009).
4. Destiny (Implementation). The last phase involves creating what will be (Steyn 2012).

Appreciative inquiry has been embraced in healthcare research, especially in different fields of nursing, but also in community development and teaching (George, Farrell and Brukwitzki 2002; Akdere 2005; Clarke et al. 2006; Farrell et al. 2007; Reed 2007; Mcadam and Mirza 2009; Gonzales and Leroy 2011; Knibbs et al. 2012; Schooley 2012). However, a search in

the databases EbscoHost (including Cinahl), Ovid (Mediline/Pubmed) and ScienceDirect/Scopus with the key words 'physiotherapy' and 'appreciative inquiry', limited to the last decade, yielded only one study (Young, Jones and Baker 2010).

In the current study, 12 physiotherapists were recruited purposively and through snowball/chain sampling to include participants from heterogeneous backgrounds in terms of where they completed their undergraduate physiotherapy degree. Interviews were conducted via telephone by trained interviewers to explore the participants' experience of the service during a year of compulsory community physiotherapy. An appreciative stance was taken in developing the interview guides. The interview schedule comprised open-ended questions in accordance with the discovery, dream and design phases in appreciative inquiry. Luckcock (2007) has set an example of not including the destiny/delivery stage in a questionnaire as was done in the current study. Questions were formulated to allow for storytelling by the participants (Michael 2005). Through the inquirer's phrasing of the questions participants were guided to focus on assets rather than deficits (Lind and Smith 2008; Fiorentino 2012; Mishra and Bhatnagar 2012).

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#### QUALITATIVE ANALYSIS

Interviews were transcribed and analysed in two phases. First the interviewers coded the text using the constant comparative method (Polit and Beck 2006; Burns and Grove 2007; Saldaña 2011). An independent researcher followed the coding method described by Tesch (1990; 1995). Themes with supporting quotes were organised into tables. The thematically dissimilar but complementary findings were then configured into a model for community physiotherapy through a bottom-up logical approach (Sandelowski et al. 2012). Strategies to ensure validity were followed as described in Table 2.6.

**Table 2.6. Types of validity and their criteria**

<b>Types of Validity</b>	<b>Description</b>	<b>Criteria</b>
Descriptive Validity	Descriptive information such as the names of subjects (confidential), setting and dates of interviews was accurately reported and overseen in the team.	Impact of investigator Context
Interpretive Validity	The degree to which participants' viewpoints, thoughts, intentions, and experiences were accurately understood and reported by the qualitative research team was determined through member checking.	Believability
Theoretical Validity	A model for community physiotherapy based on the participants' experiences was developed and gave a theoretical explanation that fitted the data and to warrant the conclusions as credible and defensible.	Theoretical framework
Generalisability	Findings were used as input into the next phase of the research and were tested with more panellists from other physiotherapy backgrounds.	Value and implications of the research
Evaluative Validity	An evaluative framework or critique was applied to the object of study	Evaluation/Outcome

Source: Hannes, Lockwood and Pearson (2010)

## PHASE 2. EXPECTATIONS OF STAKEHOLDERS

## THE DELPHI METHOD OF INQUIRY

The Delphi is one of many consensus-building techniques (Ruperto et al. 2008; Jünger et al. 2012; Mehnen, Mose and Strijker 2012). In the literature, the Delphi is labelled “variously as a ‘technique’, a ‘process’, a ‘method’, an ‘exercise’ and a ‘survey’” (Stewart 2001: 922). Linstone and Turoff (2002) originally developed the method to predict trends with an expert panel’s input, based on the justification of the superiority of a group opinion over individual opinion. A Delphi comprises iterative rounds of either postal or electronic surveys with input from a panel of anonymous experts (Gerrish and Lacey 2010). Table 2.7 shows how this study fits into the taxonomy of Delphi inquiry designs developed by Day and Bobeva (2005).

**Table 2.7. Taxonomy of Delphi inquiry designs and application in this study**

Element	Choice	Application in this study
Purpose of the study	Building theory, exploration, testing, evaluation	Round 1: Exploration – role in community physiotherapy Round 2: Consensus – on competencies Round 3: Exploration – education and assessment strategies
Number of rounds	Between two and ten	Three
Participants	Homogeneous or heterogeneous groups	Heterogeneous
Mode of operation	Face-to-face or remote access	Remote
Anonymity of panel	Full or partial	Full
Communication media	Paper-and-pen based, through telephone/fax facilitated, computerised	Electronic web-based survey distributed via e-mail
Concurrency of rounds	Sequential set of rounds or real-time online conferences	Sequential

Source: Day and Bobeva (2005)

Stewart (2001) distinguishes between a 'classical' Delphi, being a forum for establishing facts; a 'policy' Delphi, a forum for generating ideas; and a 'decision' Delphi, a forum for making decisions. Delphi studies have been used in different fields, which include health sciences education (de Villiers, de Villiers and Kent 2005; Linke and Zerfass 2012). The Delphi has been utilised to get input from citizens and service providers on policy and to determine client satisfaction (Byrne et al. 2008; Knibbs et al. 2012; Schooley 2012). In addition, a Delphi is useful when developing survey, measurement and assessment tools (Mackellar et al. 2007; Hagen et al. 2008; Lack 2009). Lastly, gaining consensus on definitions is a common use of the Delphi (Mallow and Cameron-Kelly 2006; Haggerty et al. 2007; Lee et al. 2007; Dionne et al. 2008).

Delphi studies are particularly popular in curriculum development; for example, to get consensus on competencies in different fields and professions. Examples are available in care nursing (critical care and health promotion), anaesthetics, psychiatry, teaching, emergency clinicians, continuous medical education, periodontics, family medicine, occupational therapy and for women leaders (Carroll 2005; Hawkins, Burke and Steinberg 2006; Mash, Couper and Hugo 2006; Bulger and Housner 2007; Fried and Leao 2007; Kirchberger et al. 2007; Marshall et al. 2007; Nebot et al. 2007; Wilson et al. 2007; Dionne et al. 2008; Whitehead 2008; Rohan, Ahern and Walsh 2009; Kiessling et al. 2010).

Physiotherapy research also has a history of using Delphi studies (Hale and Eales 2001; Donato et al. 2004). For example, the Delphi has been applied to gain consensus about the management of infants with cystic fibrosis and back pain and about intervention categories in physiotherapy, according to the International Classification of Disability, Functioning and Health (Finger et al. 2006; Ferguson et al. 2008; Prasad et al. 2008). Physiotherapy education studies have utilised a Delphi with the purpose of gaining consensus on the integration of disabled physiotherapy students, developing a manual therapy skills set and conducting a clinical competence assessment (Cross, Hicks and Barwell 2001; Sizer et al. 2007; Opie and Taylor 2008). As with any research method, the Delphi has benefits and disadvantages. These are listed in Table 2.8.

**Table 2.8. Advantages and criticisms of the Delphi**

<b>Advantages</b>	<b>Criticisms</b>
Versatile technique	No universally agreed guidelines
Relatively inexpensive and cost effective	Potential for lack of methodological rigour
No geographical restrictions	Time commitment of panellists
Protects panellists' anonymity	Unaccountability owing to anonymity
Confidentiality of responses, which may lead to more honest and uninhibited responses	Time consuming and high workload (selection of experts, acquiring and retaining experts)
Conducive to independent thinking and gradual idea formulation	Judgements are those of a selected group of people and may not be representative
A well-selected respondent panel can provide a broad analytical perspective	Panellists may have an idea who the other respondents are
Free of social pressure, personality influence and individual dominance	Tendency to eliminate extreme positions and force a middle-of-the-road consensus
Allows sharing of information and reasoning among participants	Requires participant skill in written communication
Can be used to reach consensus among groups hostile to each other	Potential for low response rate
Obtains reliable judgement or forecasts results	Possibly longer periods between question rounds required for providing, distributing, answering and evaluating the questionnaires
Influential participants cannot bias other members	How expert are the experts?
E-Delphi simplifies data capturing and analysis	Interaction limited to feedback from the moderator

Sources: Putz (2004), Landeta (2006), Gerrish and Lacey (2004; 2010: 234)

To overcome these disadvantages the critical issues pointed out by Day and Bobeva (2005) – summarised in Table 2.7 – were attended to as described in the following sections.

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#### POPULATION AND SAMPLING

The population for the Delphi comprised South African physiotherapists: clinicians, managers and academics. They were deemed experts because of their work and experience in the area of community physiotherapy (Powell 2003: 379). For round 1 all the members of the SASP were invited via an SASP e-newsletter. As the link to the e-survey was within a general newsletter, round 2 was sent to specific individuals: community physiotherapy lecturers at the eight physiotherapy university departments, rehabilitation managers from the NDoH and of the nine provincial health authorities, senior physiotherapists in the provinces and those busy with a year of compulsory community physiotherapy. The NDoH provided telephone numbers for those busy with compulsory community physiotherapy. Compulsory community physiotherapists that worked outside of the major centres were contacted and invited to participate in the study. The third-round survey was distributed to those panellists who responded in round 2 and in this way had shown a special interest in the research project.

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#### INSTRUMENT DEVELOPMENT

Questionnaires were distributed via e-mail as this is less costly than mail distributions and evidence shows that mail and e-mail surveys do not tend to differ in terms of response rate (Börkan 2010). The e-mail directed panellists to an online survey administered through the commercially available SurveyMonkey management system. One can use the system to design, publish and distribute electronic surveys. Responses are recorded in the system and basis analyses can be done. Alternatively data-sets can be exported to different formats included Microsoft (MS) Excel for analyses using other statistical packages.

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#### ROUND 1 INSTRUMENT

In response to the first question of round 1, panellists could comment on a comprehensive definition of community physiotherapy. In the second section of the questionnaire,

panellists had the opportunity to describe the roles and functions that a physiotherapist ideally should fulfil in community physiotherapy settings. The last section contained demographical questions. A copy of the survey instrument can be found in Appendix C

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#### ROUND 2 INSTRUMENT

Table 2.9 lists six of the phases proposed for developing a valid instrument that were used in developing the round-2 instrument (Adcock 2001; Onwuegbuzie, Bustamante and Nelson 2010; Durham, Tan and White 2011; Luyt 2012). Refer to Appendix D for a copy of the round-2 questionnaire.

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#### ROUND 3 INSTRUMENT

The items on which more than 70% agreement was reached were included in the round-3 instrument. As in round 2, the items were arranged in eight domains and the questionnaire again ended with a demographic section. Each domain had two questions. One asked about optimal educational strategies to be used in teaching and learning of the performance competencies in the specific domain. The other question asked about assessment criteria. Refer to Appendix E for a copy of the round-3 survey instrument.



**Table 2.9. Steps in the instrument development and construct validation process followed in this study to develop the survey instrument used in Delphi round 2**

<b>Instrument development and construct validation process</b>	<b>Application in this study</b>
Phase 1: Conceptualise the construct of interest (Review literature and consult a diverse group of experts)	A literature review identified the Clinical Prevention and Population Health Curriculum Framework that provided the foundation for the questionnaire and was used for qualitative analysis
Phase 2: Identify and describe behaviours that underlie the construct	Open and axial coding of study guides, interviews, and Delphi round 1 open-ended questions were conducted to identify items for the instrument
Phase 3: Develop initial instrument	Round 2 drafted instrument with Likert scales for items that comprise performance competencies and open-ended text boxes for comments
Phase 4: Field-test initial instrument	Piloted the instrument draft
Phase 5: Design and field-test revised instrument	Corrections were made based on feedback from the pilot panel
Phase 6: Validate revised instrument: quantitative analysis phase	Cronbach's $\alpha$ reliability coefficient by competency domain was calculated (See Table 5.3)

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### PILOT TESTING: ALL THREE ROUNDS

All three instruments were tested. Participants in the pilot study were invited from members of the Southern Africa FAIMER (Foundation for the Advancement of International Medical Education) Regional Institute (SAFRI) web-discussion list: two physiotherapists, one psychologist, and an occupational therapist from the Republic of South Africa, a nurse from Uganda and a doctor from the Sudan. In addition two other health professionals from the web-discussion list, one from Mozambique and one from the Fiji Islands, and two FAIMER faculty members, one each from Mexico and Malaysia, were invited. Three critical friends and the statistician also participated in the pilot study.

Pilot participants were asked to comment on the formulation, layout and content of questions to improve readability and clarity (Burns, Grove and Gray 2011). The hyperlink to the survey was sent within the body of an e-mail, so that the technical functionality of the online survey could also be tested (Eysenbach 2004).

The final reliability of the round-2 questionnaire was high, with all five domains reaching a Cronbach's  $\alpha$  of 0.85+. The overall reliability was an exceptional  $\alpha=0.99$ . (Refer to Table 5.3.)

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### STRATEGIES TO FACILITATE RESPONSE

To improve the response rate, attention was given to how the questionnaire was compiled and to the process of inviting participants and distributing the survey. The following strategies were employed to facilitate response (Haunberger 2011):

- Radio buttons were used rather than drop-down menus for question options.
- More interesting questions were put first and demographic questions towards the end of the questionnaire (Haunberger 2011).
- The questionnaire layout was a combination of one question per page and the option to scroll between questions (Peytchev et al. 2006).
- Questions were formatted so that the layout was friendly and looked easy to navigate (Frohlich 2002).

- For the second round, panellists were invited to participate via a sincere e-mail, which requested assistance with the research. This pre-notification emphasised the importance of the survey (Frohlich 2002).
- The words 'survey' and 'research' were not used in the subject heading of the invitation e-mail.
- The topic sentence was phrased to increase its potential salience – the association of importance and/or timeliness of a specific topic (Sheehan 2001).
- The survey was sent to those who responded within a week.
- The invitation e-mail indicated approximately how long it would take to complete the questionnaire.
- A cut-off date was set in the invitation e-mail.
- An option to request feedback on the findings was given (Baruch and Holtom 2008).
- Questionnaires were distributed early in the week when panellists were expected to be more energetic than towards the end of the week.
- With the SurveyMonkey system reminders could be sent to those who had not responded.
- Reminders were sent within two weeks of distribution (Deutskens et al. 2004; Keeney, Hasson and Mckenna 2006).
- The IP address of the client computer was used to identify potential duplicate entries from the same user (Eysenbach 2004).

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## ANALYSIS

The sample profile was determined by applying descriptive statistics to the demographic variables.

In rounds 1 and 3 thematic qualitative data analysis using the constant comparison method was applied (Denzin and Lincoln 2005). In addition content analysis was performed on the round-1 qualitative data as was framework analysis with the Clinical Prevention and Population Health Curriculum Framework (Saldaña 2009; Maeshiro et al. 2011; Saldaña 2012).

## CHAPTER 2. Methodology

The reliability of the round-2 questionnaire was investigated with Cronbach's  $\alpha$  reliability coefficient for each of the eight competency domains and for the questionnaire overall. Percentage agreement for each level of agreement for each statement (performance competency) by Likert scale score (Holey et al. 2007) was *a priori* set at 70%. The level of agreement on competencies varies between 55% and 100% in the literature (Powell 2003: 379). The mean score and confidence intervals were also calculated for each statement (Greatorex and Dexter 2000).

### PHASE 3. STANDARDS: RECOMMENDATIONS FOR A MESO-CURRICULUM

Topics for each of the competency domains or overall professional roles (clinician, communicator and collaborator, professional, scholar, health promoter, population health practitioner, change agent, and manager and leader) were scheduled over the four study years of the curriculum. The topics were linked to educational and assessment strategies suggested by panellists in Delphi round 3 and were supported by literature.

### CONCLUSION

The chapter described the setting of community physiotherapy undergraduate education in South Africa. The nature of the research as a mixed methods study was discussed, followed by an explanation of the three phases of the research and their components. Chapter 3 deals with the first step in the first phase of the research; i.e. the document analysis of community physiotherapy curricula.

### 3. SITUATION ANALYSIS

*If we teach today's students as we taught yesterday's,  
we rob them of tomorrow.*

John Dewey

#### INTRODUCTION

All South African (SA) medical schools have undertaken major curriculum reform over the past 20 years (Burch 2007). However, published literature describing transformational curriculum changes, and their educational impact, is limited (Burch 2007). Information on publications regarding physiotherapy curricula is also scarce.

Internationally two efforts towards developing physiotherapy curriculum frameworks were found: one developed in Europe (Broberg et al. 2003) and the other in Canada (Darrah et al. 2006). Broberg et al. (2003) organise their framework along three streams, which are content, student learning, and the sociocultural context. Darrah et al. (2006) developed the CORE (client-orientated research and evaluation) Model of Best Practice and Clinical Decision-making around four principles, which are the integration of theory, clinical practice and research; client-orientation and concepts from the ICF. Both of these models, although they incorporate contextual factors, have a clinical perspective that does not embrace public health or community development; while public health and community development are core issues in the South African context. Similarly, Stainsby and Bannigan (2012) identified skills for physiotherapy students working in community settings in the United Kingdom. The skills sets – communication; function; assessment and treatment; coping in an uncontrolled environment; and prioritisation – were limited to physiotherapy in home settings.

Ramklass (2009a) asserts that in SA, physiotherapy education has “remained relatively static” since 1994 (Ramklass 2009b). Education at one university investigated by Ramklass (2009b), still did physiotherapy clinical training mainly in urban and institutionalised settings (Ramklass 2009b). The author (Ramklass 2009b) also identified gaps in knowledge and skills

around practice in resource-poor settings, language and cultural barriers, social responsibility, empathy, interpersonal relationships and administration.

Innovation at two other universities, however, describes clinical learning in community settings (Futter 2003). In one of the studies students worked mainly at clinics during their service-learning placement and did domiciliary visits with community workers (Krause 2007). In comparison, the community-based placement at Futter's institution addressed wider public health elements, such as the cultural determinants of health (Futter 2003).

The first step when reviewing curricula is to revisit the "problem" that the curriculum needs to address in terms of the health profile and policies of the country (Kern et al. 2009). Owing to the dynamic nature of the health sector, curricula for the education of healthcare practitioners, including physiotherapists, need to be periodically reviewed for relevance and quality (Davenport, Spath and Blauvelt 2009).

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#### SOUTH AFRICAN HEALTH POLICY ENVIRONMENT

The health sector is a key player in the South African Government's strategy to fight poverty, discrimination and to build the nation (Democracy and Governance Human Science Research Council (Hsrc) 2005; The Presidency RSA 2008; Policy and Co-Ordination and Advisory Service: Social Sector 2010; The Presidency RSA 2010; World Health Organization 2010). The vision for the health sector is "A Long and Healthy Life for All South Africans" (National Department of Health 2009a). The South African administration's Programme of Action includes a ten-point plan for the improvement of the health sector, which was formalised in a Negotiated Service Delivery Agreement (NSDA) (The Presidency: National Planning Commission 2010). The National Department of Health specifically agreed to improve life expectancy of South Africans, to curb child and maternal mortality, to decrease the burden of HIV and tuberculosis and to increase the effectiveness of the healthcare system, as part of the Presidency's Medium Term Strategic Framework (National Department of Health 2012b).

These policies build on the three streams of the re-engineering of the primary healthcare system: (1) district clinical specialist teams; (2) strengthening of school health services; and

(3) ward-based primary healthcare teams (National Department of Health 2008a; c. 2011; Community Media Trust 2011; National Department of Health 2012c; National Department of Health Ministerial Task Team 2012; National Department of Health). Although physiotherapists are not part of these teams, they are indispensable for building capacity in these teams, which include community health workers, and being a part of the referral system (World Health Organization 2006b).

The gap in the provision of community health workers, core members of the primary healthcare teams, is substantial (National Department of Health 2011b). The implication of this under-provision is that other team members may have to step in in areas of general competence needed by the team, such as epidemiological surveys, health promotion and prevention, palliative care, social mobilisation, linking resources with community needs, improvement of health outcomes and the celebration of team health days (Lehmann and Sanders 2007). In South Africa practitioners of traditional African medicine are also role players in providing health care (National Department of Health 2008a). Therefore, “a key professional competency is the ability to work with teams consisting largely of basic and ancillary health workers and supportive staff” (Frenk et al. 2010: 1984). Another responsibility of health practitioners is therefore the transfer of skills to these cadres of workers (World Health Organization 2006a; National Department of Health 2011a; 2011b).

Even in its guidelines for health establishments, the National Department of Health emphasises public health (2011a). In this document “public health” is defined as follows:

The Public Health domain covers how health facilities should work with [non-governmental organisations] NGOs and other healthcare providers along with local communities and relevant sectors, to promote health, prevent illness and reduce further complications; and ensure that integrated and quality care is provided for their whole community, including during disasters. (National Department of Health 2011a: 11)

Within the decentralised district health system, partnerships with community structures, such as community-based-organisations (CBOs) for mobilising community action and

advocacy around health issues are indeed a recurrent theme (National Department of Health 2004; 2005b; 2005c; 2007b).

In addition, the National Department of Health developed guidelines for the management of health services, including the use of technology in the delivery of healthcare services and mentorship (National Department of Health 2011d; 2012e).

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#### HEALTH PROFILE OF THE SOUTH AFRICAN POPULATION

The health profile of the country is another driver of the curriculum (Kern et al. 2009). The quadruple burden of disease in SA (Groenewald et al. 2012) comprises (1) communicable, maternal and nutritional diseases; (2) HIV and tuberculosis (TB); (3) non-communicable diseases; and (4) injuries. The top ten risk factors of mortality directly relevant to physiotherapy are tobacco addiction, lack of physical activity and hypertension and diabetes (as risk factors) (Groenewald et al. 2012).

Target groups that receive emphasis in the South African health policy environment are children, youth, women and people living with disability (National Department of Health 2000, 2001; 2005a; 2007a; 2008c; 2008b; The Presidency RSA 2009; The Presidency RSA and The United Nations Children's Fund 2009; National Department of Health 2011c; 2012a; 2012d).

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#### AIM OF THE STUDY

The purpose of this phase of the study is to give an overview of education in community physiotherapy in South Africa – from study guides for community placements – as a guide for benchmarking by individual institutions. Another aim is to discuss how the current health priorities discussed above are reflected in these curricula.



## METHODS

### RESEARCH SETTING AND POPULATION

SA has a three-tiered health system with healthcare services being rendered at primary, secondary and tertiary levels (Coovadia et al. 2009), with some clinics and hospitals having additional outreach programmes. Therefore, the training of health science students needs to occur in different settings, including community-based organisations. In South Africa, eight city-based universities offer physiotherapy training as a four-year degree at Level 8 of the South African Qualifications Authority (SAQA): the University of the Free State, the University of KwaZulu-Natal, the University of Limpopo (Medunsa campus), the University of Pretoria, Stellenbosch University, the University of Cape Town, the University of the Western Cape and the University of Witwatersrand. Urban community-based training is accessible, but rural and remote placements have significant logistical and cost implications. Programmes need to comply with the minimum standards set by both the relevant Quality Control Council's Standard Generating Bodies (SGBs) and the Health Professions Council of South Africa (HPCSA). All university departments that offered physiotherapy programmes were invited to participate in the study.

### RESEARCH DESIGN

The research design for this study was a document analysis – a type of audit where documents are scoured to gain a clearer picture of the situation being investigated. The documents that were analysed were the SAQA Physiotherapy Qualifications document (2005) with institutions' exit-level outcomes and the study guides of community and/or physiotherapy placements (2008) at the identified training institutions.

### DATA COLLECTION STRATEGIES

The registered SAQA qualifications were downloaded from the National Qualifications Framework (NQF) website. To obtain the relevant study guides from the training institutions, an e-mail explaining the aim and procedure of this study was sent to the heads of each of the physiotherapy departments in the RSA (refer to Appendix F). Three types of

documents were requested – the curriculum for community-based education; learning outcomes of syllabi preparing students for work in community and public health settings; and the learning outcomes for the placement(s) themselves. Responses indicated that the timing of the request was inconvenient. (Refer to Appendix G and Appendix H.) Follow-up e-mails were sent and telephone calls were made to the relevant individuals until at least one document had been received from each university about four months after the first invitation. (Refer to Appendix I and to Appendix J for the final e-mail.) Further attempts at obtaining full curricula were not made.

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#### ETHICAL CONSIDERATIONS

The Ethics Committee of the Faculty of Health Sciences, University of Pretoria, approved the study (Ref 93/2008) (Appendix K). Providing the requested documents implied informed consent to participate.

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#### DATA ANALYSIS PROCEDURES

Qualitative content analysis was applied to manifest content of the texts (Graneheim and Lundman 2004). The unit of analysis was all the documents in each category (SAQA and study guides) from one university. Words, phrases, sentences or paragraphs “containing aspects related to each other through their content and context” (Graneheim and Lundman 2004: 106) were handled as meaning units for coding purposes. A first round of paper-based open coding was done. The list of codes were subsequently abstracted into categories and linked into themes. A second round of coding was done using AtlasTi 6.2 software (Refer to Appendix L for an example of a list of codes and quotes). Frequency counts were done in MS Excel (Version 2003).

## RESULTS

## DESCRIPTION OF THE SAMPLE

The officially registered SAQA physiotherapy qualifications at the time of the study were used. Of these registered, seven were dated 2009 and one was dated 2006. Six universities submitted study guides and one submitted the syllabus of a module and topics of a module.

## DOCUMENT ANALYSIS OF THE SAQA PROGRAMME REGISTRATION DOCUMENTS

## NATIONAL QUALIFICATION FRAMEWORK (NQF) SUB FIELDS

The sub fields selected by the physiotherapy university departments for registration of their qualifications (N=8) are indicated in Table 3.1. The highest number of universities (n=3) were registered in the field traditionally associated with the rehabilitation component of comprehensive healthcare, and two in curative health. Two selected a field in the preventative extreme of the comprehensive healthcare continuum, with one selecting a pure science sub field.

**Table 3.1. NQF sub field in which the qualifications were registered (N=8)**

NQF Sub Field	Frequency
Rehabilitative Health/Services	3
Curative Health	2
Promotive Health and Developmental Services	1
Preventive Health	1
Physical Sciences	1

## SAQA EXIT-LEVEL OUTCOMES

The main themes or competencies that emerged from the analysis of the exit-level outcomes of the qualifications as registered with SAQA are listed in the first columns of Table 3.2 and Table 3.3. The number of analysed meaning units that contributed to each theme is given in columns according to university, with the total number of meaning units supporting each theme or competency in the last column of Table 3.2. The categories that made up each theme are listed in the second column of Table 3.2.

**Table 3.2. The distribution of competency category of exit-level outcomes for the registered undergraduate physiotherapy qualification by university (N=8)**

Competency categories	Number of quotes by University								Total no. of Quotes
	1	2	3	4	5	6	7	8	
Render a physiotherapy service	1	2	10	4	3	4	8	2	34
Act professionally	2	1	3	1	2	3	3	1	16
Communicate and collaborate	1	1	4	2	2	1	1	1	13
Practice evidence-based physiotherapy	-	2	1	2	1	1	2	2	11
<b>Totals</b>	4	6	18	9	8	9	14	6	74

The codes that make up the competencies are listed in the second column of Table 3.3

**Table 3.3. Codes by competency category for the exit-levels outcomes for the registered undergraduate physiotherapy qualifications (N=8)**

<b>Competency category</b>	<b>Codes</b>
<b>Act professionally</b>	<ul style="list-style-type: none"> <li>- Attributes: Caring, ethical, autonomous, socially responsive, flexible, innovative, life-long learner and leader; critical and creative thinker and problem-solver</li> <li>- Scope and realities of the profession and relevant laws and policies adhered to</li> <li>- Self- and peer-review</li> </ul>
<b>Communicate and Collaborate</b>	<ul style="list-style-type: none"> <li>- Multidisciplinary team work</li> <li>- Health education provision</li> <li>- Written and verbal communication</li> <li>- Client-centred approach</li> </ul>
<b>Render a physiotherapy service</b>	<ul style="list-style-type: none"> <li>- Community needs addressed</li> <li>- Comprehensive services provide: preventive, promotive, curative and rehabilitative</li> <li>- Families, groups, societies and the broader population served</li> <li>- Staff developed</li> <li>- Systems thinking</li> </ul>
<b>Practice evidence-based physiotherapy</b>	<ul style="list-style-type: none"> <li>- Scientific evidence appraised, used and developed</li> </ul>

Table 3.4 demonstrates the categories and themes according to university with the summed totals. Table 3.5 shows the teaching-learning settings and type of patients (by age group and conditions) treated by students that were explicitly mentioned in the study guides. The teaching-learning strategies employed at each university are listed in Table 3.6.

**Table 3.4. Summary of the topics and themes in the exit-level outcomes for study guides (N=8)**

Themes	Topics (n=24)	University								Frequency
		1	2	3	4	5	6	7	8	
<b>Foundation</b>	Determinants of health		X	X	X	X	X		X	6
	Disability theory	X	X	X	X	X	X			6
<b>Principles</b>	Social responsibility	X		X			X			3
	The rehabilitation process				X	X			X	3
	Asset-based approach		X		X					2
	Bio-psychosocial model				X		X			2
	Community development			X		X				2
	Introduction to Public Health			X						1
	Participatory models					X				1
	Subtotal									<b>28</b>
	<b>Health system and policies</b>	Health-care System/ District health	X	X	X		X	X		
Levels of care		X	X	X	X					4
Laws, acts, policies		X		X	X					3
Welfare policy (e.g. grants)						X			X	2
Inter-sectoral collaboration								X		1
Subtotal:										<b>17</b>
<b>Health education and promotion</b>	Adult education skills/ Skills transfer			X	X	X		X		4
	Health Education	X	X	X		X				4
	Screening		X			X			X	3
	Subtotal									<b>11</b>
<b>Management</b>	Evaluation		X	X		X		X		4
	Assess the environment		X	X						2
	Planning and organising programmes and projects			X					X	2
	Outcome measures in public health					X			X	2
	Information Technology						X			1
	Subtotal:									<b>9</b>
	<b>Total</b>									<b>65</b>

Not included: Reflection, Communication skills, Group dynamics, Time management, Cultural and gender sensitivity, Ethical and Professional conduct and interdisciplinary collaboration

**Table 3.5. Distribution of setting and target groups specified in community/public health study guides, by university (N=8)**

Category	Sub category(n=13)	University Physiotherapy								Frequency
		Department								
		1	2	3	4	5	6	7	8	
<b>Settings</b>	Community settings									
	- Homes of clients	X	X	X						3
	- Schools	X		X				X		3
	- Workplace/Factories	X		X				X		3
	- Clinics	X		X						2
	- Homes for the elderly	X		X						2
	- Rural/Urban	X		X						2
<b>Target groups</b>	Clients with:									
	- Older age			X		X		X	X	4
	- Disability	X						X		2
	- Disability, Sport participation	X								1
	- Hypertension	X								1
	- Mental illness					X				1
	- Tuberculosis	X								1
	- HIV	X								1
	<b>Total:</b>	<b>11</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	

**Table 3.6. Types of assessment and learning strategies by university**

University	Assessment strategy	Learning strategy
1	Oral presentation of a poster	Spend 8 h with a person with disabilities (minimum of three to four visits) Service learning block at community health centre and old age homes (Three days clinical block per student group of three to four students)
2	Portfolio of evidence Power point presentations	Case report of a client at home Health talk Screening of a children/babies and addressing problems
3	Block evaluation Health-education group session	Small group discussions Home visits Service learning projects
4	Test Assignment	Lectures Small group discussions Problem-based learning using simple paper cases Projects during field trips
5	Not explicit	Not explicit
6	Not available	
7	Written tests Assignment	Lectures Group-work Presentations Site visits
8	Home visit Group activity (class or education session) Continuous evaluation on the block Portfolio: Documentation of service learning project	Home visit Factory visit Personal Strength, Weakness, Opportunity and Threat analysis. Screening for participation in group classes Information session Service learning projects Facilitation session <ul style="list-style-type: none"> <li>- About time management in different community areas</li> <li>- Ethical issues around disability grants</li> </ul>



## DISCUSSION

Findings from this study give an overview of education in community physiotherapy in South Africa in terms of topics dealt with in the undergraduate community physiotherapy curricula and teaching-learning strategies followed to develop five exit-level competencies: to deliver a physiotherapy service, to act professionally, to collaborate, communicate and to practise according to scientific evidence. Four themes emerged from study guides: foundational topics, such as the determinants of health, the health system – specifically district health – and policies, health education and promotion, and the management of physiotherapy services.

### NATIONAL QUALIFICATIONS FRAMEWORK (NQF) SUB FIELDS

Programmes were registered in five different fields of the NQF. The NQF sub field that each institution selected for registration of the respective qualifications may signify the underlying philosophy of each course. Only two institutions selected a field in the preventative extreme of the comprehensive healthcare continuum. This continuum stretched from health protection and health promotion at one end, to cure, as well as rehabilitation and palliative care, at the other. As physiotherapy's scope covers the full spectrum of comprehensive healthcare and in light of the quadruple burden of disease in SA, this finding does not come as a surprise and shows the difference in focus of universities while complying with the core prescriptions of the HPCSA (2003).

### EXIT-LEVEL- AND COMMUNITY-BLOCK OUTCOMES

The topics under the theme “foundational principles” are related to the philosophy and perspectives that guide physiotherapy interventions. For example, not only are interventions to address disablement (impairments, activity and participation limitations) important (e.g. “the rehabilitation process,”), but also attending to the factors that cause dysfunction in the first place (“determinants of health,” “biopsychosocial model”).

Having a preventative stance links moving beyond the individual patient to the communities of which they form part (“Public Health”). The themes in this topic imply attention to

### CHAPTER 3. Situation analysis

physiotherapist and community strengths and facilitators (“asset-based approach”). The topics also speak to the fact that physiotherapy is not only about disease, but also about uplifting communities (“community development”), working with clients and not for them (“participatory models”) and tackling inequities in the service (“social responsibility”) and human right issues (“disability theory”).

The theme “health system and policies” dealt with understanding the healthcare system (“levels of care,” “inter-sectoral collaboration”) and the policies and acts guiding practice (“laws, policies,” and “welfare policy”). Skills to educate patients about their health (“adult education skills/skills transfer, “health education” and identifying risk factors (“screening”) were dealt with under the theme “health education and promotion”. The theme “management” addressed the issue of strategically providing and organising physiotherapy services (“assess the environment,” “planning and organising programmes and projects”) and measuring their effect at population level (“outcome measures in public health”). The “management” theme also dealt with the use of information technology when providing services.

In the SAQA qualification documents of the universities the cross-field outcomes therefore received much attention. These are general competencies to prepare students for the challenges of the work environment, such as to be able to work in teams and to be able to communicate – important themes in current curriculum frameworks (American Council for Graduate Medical Education Board 2007; Shilton et al. 2008; Therapy Project Office 2008; Barry et al. 2009; Lin et al. 2009; Verma et al. 2009; National Physiotherapy Advice Committee 2010; Grace and Trede 2011; Maeshiro et al. 2011; Basu and Roberts 2012; Pellegrino and Hilton 2012; Voogt and Roblin 2012).

Although the professional physiotherapy-specific competencies cannot be overemphasised, the study shows that physiotherapy educators have embraced the notion of educating well-rounded reflective professionals. The competency outcomes found in this study encompass the roles, outcomes, domains and behaviours identified by organisations internationally. (See Table 3.7.)

## CHAPTER 3. Situation analysis

For example, attention had already been drawn in the Flexner report of 1910 to the fact that medical doctors need to be more than clinicians to make an impact on healthcare in societies (Flexner 1910; 1990). In response to the multi-faceted nature of healthcare the World Health Organization (WHO) formulated five roles for the medical doctor (World Health Organization 1996: 08) These roles were care provider, communicator, community leader, decision maker and manager.

Table 3.7 gives a summary of the further development of similar roles. The CanMEDS model (Frank and Danoff 2007) made the health advocacy role (previously included in the communicator role) and that of a professional and scholar explicit. The United Kingdom General Medical Council (UK GMC) (2009) and Frenk et al. (2010) each simplified the roles to three, with the last of the three emphasising the role as change agent. The Chartered Society of Physiotherapy Chartered Society of Physiotherapy (c.2012) in turn determined the objectives of education of physiotherapy undergraduates and the World Confederation for Physical Therapy (World Confederation for Physical Therapy 2011b) generic behaviours. An essential competency as part of the communicator role is that of cultural competency, especially if the diversity in the student and client profiles is taken into account (Das 2005; Bentley, Jovanovic and Sharma 2008).

**Table 3.7. Summary of roles and attributes for medical doctors/physiotherapists internationally**

Boelen <sup>a</sup> [c. 1996]	CanMEDS (2005)	ACGME (2007) <sup>b</sup>	GMC (2009) <sup>c</sup>	Frenk et al. (2010) <sup>d</sup>	CSP <sup>e</sup>	WCPT (2011)	RSA (2009) <sup>f</sup>
- Care provider	- Medical expert	- Patient care	- Practitioner	- Expert	- Putting	-Public health	-Clinical
- Communicator	- Communicator	- Medical care	- Professional	(Information	patient/popula-	strategies	practitioner
- Community leader	- Collaborator	- Practice-based learning and improvement	- Scholar and scientist	Skills)	tion needs at the centre	- Supervising and delegating to others	-Understand foundational principles
- Decision-maker	Advocate	- Interpersonal and communication skills		(Socialisation, values)	- Supporting	- Leading	-Render a physiotherapy service
- Manager	- Professional	- Professionalism		- Change agent (leadership attributes)	- Educating	- Managing	-Work within the health system and policies
	- Scholar	- System-based practice			- Leading	- Teaching	- Communicate and collaborate
	- Manager				- Managing	- Developing and implementing health policy, research	- Manage
					- Researching	- Advocating for patients/clients and for health	-Act professionally-Practice evidence-based physiotherapy Manage

<sup>a</sup> Five-star doctor; <sup>b</sup> Tomorrow's doctor; <sup>c</sup> Accreditation Council for Graduate Medical Education <sup>d</sup> Chartered Society for Physiotherapy: Outcomes and objectives of education; <sup>e</sup> Generic behaviours; <sup>f</sup> Clinical functions were not specifically coded

Similar themes can be found in curricula from Canada (University of British Columbia Department of Physiotherapy n.d.), Nigeria (Medical Rehabilitation Therapists (Registration) Board of Nigeria n.d.), and Ethiopia (Gondor University Department of Physiotherapy n.d.).

#### ALIGNMENT WITH THE POLICY ENVIRONMENT AND HEALTH PROFILE OF THE SOUTH AFRICAN POPULATION

Almost all of the universities indicated that they address the social determinants of health, the district health system and health education in their curricula. These themes are aligned with the country's vision to alleviate poverty and improve the life expectancy of its people (National Department of Health 2002a; 2004; 2012b; The Presidency RSA 2008; 2010). A focus on health education and health promotion is the case in physiotherapy education in both developed and developing countries. For example, in the UK health promotion and the theme of "staying healthy" are embedded in the final year of the curriculum (Chartered Society of Physiotherapy c.2012). Within this theme, students learn how to safely prescribe, implement and monitor physical activity programmes in order to address obesity, to help prevent ill health and falls in the elderly, and to improve the health of people with learning disabilities and mental health issues.

Equally well-presented in South African outcomes is the evaluation of programmes that are linked with improved effectiveness of the the healthcare system (National Department of Health 2007b). However, the level of attention that three streams of re-engineered primary healthcare receive is not clear (National Department of Health 2008a; 2012c; National Department of Health Ministerial Task Team 2012). One may be skeptical, as no one explicitly refers to work with mid-level workers, volunteers and practitioners of traditional African medicine. As only one university indicated schools as a setting of education, it appears as if school health has not been embraced.

The rest of the themes, such as community development and social responsibility, were explicitly addressed by less than half of the universities. Another apparent neglected field is that of e-Health (National Department of Health 2012e).

Physiotherapists are skilled to address the quadruple burden of disease in SA. However, however, priority conditions have been mentioned explicitly only in the minority of the education institutions. Paradoxically to the Government's focus on child and youth health (The Presidency RSA 2009; The Presidency RSA and The United Nations Children's Fund 2009; National Department of Health 2012a; 2012c) , the majority of study guides were explicit about services to older clients.

All the settings were outside of hospitals, such as at clients' homes, industry and community institutions (homes for the elderly). Less than half of the institutions specified home visits as a learning opportunity during the community/public health placement. As a core component of civic engagement, service-learning is defined as a course-based, credit bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs, and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility. (Bringle and Hatcher 2009:38)

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#### TEACHING AND LEARNING STRATEGIES

Those universities whose documents included learning strategies tend to use authentic problem-orientated stimuli to facilitate learning, ranging from paper cases to treatment of real patients during home visits (Donaghy and Morss 2007; Bowe, Voss and Thomas Aretz 2009). Experiential learning, with site visits, projects such as screening, field work and service learning, was common. These approaches are fundamental components for developing complex competencies, such as those indicated in the learning outcomes (Frantz and Rhoda 2007; Rodger et al. 2008; Adam, Strong and Chipchase 2013).

Educators, indeed, endorse service learning for teaching complicated ideas, such as the social determinants of health and to develop civic-minded graduates (Hatcher and Erasmus 2008; Hunt, Bonham and Jones 2011). The andragogy has been useful in teaching preventative medicine, promoting wellness and public health (Nokes et al. 2005; Cashman and Seifer 2008; Thurgood 2009; Buckner et al. 2010; Chastonay et al. 2012). The reciprocal

relationship between learning and service benefits the clients through increased access to healthcare (Jimenez et al. 2008).

Service-learning is defined as a “course-based, credit bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs, and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility”. (Bringle and Hatcher 2009:38)

Examples of reflexive activities used in these South African universities are assignments like presentations, individual reflection on one’s own strengths and weaknesses, reflection in small groups and discussions about ethical issues (Eyler 2002). A portfolio (used by two institutions) is particularly useful, if combined with feedback, to demonstrate professional development (Mori, Batty and Brooks 2008; Buckley et al. 2009).

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#### LIMITATIONS OF THE RESEARCH

A limitation of the study is that the study guides were used as a proxy for the full curriculum and were possibly not a full representation of the curriculum. The findings are not a comprehensive view of the universities’ education standards in terms of community and public health physiotherapy, as no university’s full curriculum was available for the document analysis. One reason may be that the timing of the request was not quite convenient, as people were scaling down at the end of the academic year. Also exit-level competencies are broadly stated and do not reflect detailed elements, such as, for example, the type of healthcare workers seen as part of the healthcare team.

Findings from the study guide document analysis must, therefore, be interpreted with caution, as the documents that were analysed provided only a snapshot of the curriculum. Outcomes not listed by certain universities may well be covered in other blocks or modules. Clinical competencies were also excluded from the document analysis.

The document analysis included only documents from the final two years of the four-year degrees. However, a systematic review of clinical- and community-based education of medical students found that early exposure – within the first two years of study – had a range of benefits similar to Futter’s (2003) findings (Dornan et al. 2006). These benefits included improved motivation, professional development, confidence and communication when interacting with patients, as well as clinical skills. Students better understood the structure and function of the healthcare system and the role of preventative care.

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#### IMPLICATIONS FOR PRACTICE

Despite progress towards community-based education, each of the universities has gaps in its community/public health curricula that need to be reviewed against the health policies and priorities in the country.

The special interest group for public health of the South African Society of Physiotherapy (SASP) has been slow to get off the ground. Academics need to drive this initiative. Forming a virtual community of practice using a social media platform like “Google groups” may be a viable option. Resources, such as case studies, can be shared via this platform. Owing to the interdisciplinary nature of public health, linking with multidisciplinary groups, such as the recently launched Rural Rehab South Africa (RuRaSa) ([www.ruralrehab.co.za](http://www.ruralrehab.co.za)) is recommended.

Recently qualified physiotherapists are a rich source of information about the realities of community service in South Africa that should be tapped. Incorporating these physiotherapists’ experiences of community physiotherapy would further contribute to authentic educational experiences. For example, they need to develop resilience during their studies to deal with sub-optimal practice environments in the public sector (Mostert-Wentzel, Frantz and van Rooijen 2013b). A Delphi study with clinicians, managers and academics identified that the clinician role stays central even in community work. However, professionalism, communication and collaboration, inquiry-led practice, clinical prevention and health promotion, population health and management and leadership community physiotherapy needs to complement the clinician role.



## CHAPTER 3. Situation analysis

Research into education practices in physiotherapy education, specifically community-based training is needed to identify best practices for pedagogical strategies and assessment (Chipchase, Williams and Robertson 2010).

The next chapter describes how the recommended exploration of the experiences of newly qualified physiotherapists of community physiotherapy was carried out.

## 4. COMMUNITY PHYSIOTHERAPY MODEL

*We only think when we are confronted with problems.*

John Dewey

### INTRODUCTION

Chapter 3 describes the first step in the Six-step model, which is a general needs assessment for the curriculum. The chapter raised the question: “Who do our physiotherapy programmes train students to cater for?” In this chapter the situation analysis continues, in this case to answer the question: “What are the needs of the targeted learners – as voiced by newly qualified physiotherapists?”

### BACKGROUND

Local healthcare practices should underpin competency-based curricula, drawing from global knowledge and best practices (Kelley 2011). In spite of the emphasis on the interrelatedness of healthcare education and the healthcare environment (Frenk et al. 2010), and on the social accountability of institutions, ‘content, organisation, and delivery of health professional education have failed to serve the needs and interests of patients and populations.’ (Horton 2010). Notwithstanding curriculum changes in response to demands in the health sector (Ramklass 2009a), limitations in physiotherapy curricula have been reported nationally and internationally (Broberg et al. 2003).

Work-based training assessments to guide the development or improvement of education programmes are uncommon, and sparse in physiotherapy (Gould et al. 2004; Lindquist et al. 2006). Integration of literature and policy documents or consulting with experts is used when developing entry-level programmes (Krause et al. 2006). However, newly graduated community-service physiotherapists would be a more appropriate source to determine enhancements needed in the undergraduate physiotherapy curriculum. Instead of targeting current students, the needs of newly qualified physiotherapists, who have completed a year of compulsory community service, were therefore explored. The graduate physiotherapists

## CHAPTER 4: Community physiotherapy model

had an added vantage point to current students, as they had experienced at first hand the strengths and limitations of their undergraduate physiotherapy training while implementing community physiotherapy.

Compulsory community service as a strategy to improve staffing has been implemented in more than 70 countries (Grobler et al. 2009; Frehywot et al. 2010). Since the inception of compulsory community service in South Africa, how it has been experienced by young professionals such as doctors, dentists, dieticians, speech-language therapists and audiologists and physiotherapists has been investigated (Naidoo and Chikte 2002; Visser et al. 2006; Paterson, Green and Maunder 2007; Khan, Knight and Esterhuizen 2009; Frehywot et al. 2010). Some findings from these studies included system and management deficiencies, like the lack of profession-specific supervision; limitations due to language and cultural diversity; and skills not covered sufficiently during training. On the positive side most of these young professionals felt that they had gained skills and confidence and had meaningfully contributed to healthcare. Recommendations from these studies focused on policy and management issues, with less attention on education, apart from Ramklass (Ramklass 2009a; 2009b). Ramklass's studies were, however, limited to one education institution and one province. A further limitation of these studies referred to in the previous paragraph is that they used questionnaires and semi-structured interviews, and focus group discussions with questions arranged along broad topics. This approach may bias participants to over emphasise the constraints of their community-service experience, as was the case with speech-language therapists and audiologists in the study by Paterson, Green and Maunder (Paterson et al. 2007). Only one concept in their model was positive, i.e. 'professional growth and improved service'. This concept had no explicit elements listed in the model's diagram. On the other hand, 14 elements were listed under 'obstructions and constraints' that led to 'stunted professional growth and poor services'.

The aim of this study was to explore the experiences of community-service physiotherapists in South Africa as a point of departure for curriculum reform, using an appreciative inquiry framework (Reed 2007). A principle of this stance is that words shape reality, and that a positive approach creates energy, compared to traditional ways of investigation with questions about needs/challenges. In contrast to deficit approaches, appreciative inquiry

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uses what is already working well for possible further improvement. Refer to Chapter 2 for further justification for the selection of this approach.

### METHODS

#### STUDY DESIGN

This study used a qualitative contextual exploratory design. The justification for the qualitative component of the research design in this overall mixed methods study is highlighted in Chapters 1 and 2.

Data analysis was not theory-driven but data-driven – data for this specific context (graduated physiotherapists doing compulsory community physiotherapy in South Africa). Patterns and meaning were sought in the data to develop a model to understand community physiotherapy in this context (Gelo, Braakmann, and Benetka 2008; Tashakkori and Teddlie 2010).

The aim in this phase was not to test pre-conceived ideas about community physiotherapy, but to explore the participants' views. Interviews were therefore a cooperative exploration between the interviewer and the participant (DiCicco-Bloom and Crabtree 2006). Objective responses were not sought, but personal subjective perceptions and opinions. Interviews started with broad open-ended questions and interviewers were encouraged to use probing and follow-up questions, rather than another possible question from the interview-schedule. Boddy (2005) used focus group interviews compared to group discussions to illustrate the contrast between positivistic objective inquiry that leads to information, and exploratory, open, non-directive discussions that lead to understanding (Cowley 2000 in Boddy 2005).

#### SAMPLE

Physiotherapists who were busy with, or had completed, a year of compulsory community service in the preceding four years were approached to take part in the study. A combination of sampling methods was used. Purposive sampling was employed (Tongco 2007), where physiotherapists known to the interviewers who would be able to provide rich

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information were recruited telephonically. In addition, snowball sampling led to four referrals (Noy 2008). Heterogeneousness in terms of gender, mother tongue, university attended and work setting – e.g. urban and rural, including community settings, clinics, and public and military hospitals – guided the choice of participants. The first 15 participants who were willing to participate were included (Guest, Bunce and Johnson 2006). A further seven from 39 physiotherapists who had done their compulsory community service during 2011 and 2012 responded to an invitation to verify the model developed from the findings.

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### INTERVIEW SCHEDULE

Open-ended interviews are one appropriate method of gathering views and experiences (Wilson 2012). The four distinct steps of appreciative inquiry; e.g. describe, dream, desire and design (Richer et al. 2009), guided the development of the interview schedule. The first interview question probed interviewees' highlights during the year of service. The second question focused on desires for ideal physiotherapy service during such a year. The third inquired about recommendations for positive changes to reach a desired better future. Participants were asked about their experience and were not asked to report on the self-perceived levels of their skills, as studies showed that newly graduated health professionals lack the ability to accurately self-assess (Davis et al. 2006).

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### PROCEDURE

Interviews were conducted by three trained final-year physiotherapy students, after approval by the Faculty Ethics Committee (Reference: 26/09). They phoned each participant to explain the aim of the study, the format and duration (approximately half an hour) of the interviews, and made an appointment for the next phone call. At the start of the second call the participant's rights were explained; e.g. that continuation with the interview implied informed consent. The interviews were conducted in a language that interviewees understood (English), and they were allowed to switch to a different language, also understood by the interviewer (Afrikaans).

Participants were aware that the interviews were tape recorded, and that a second researcher was writing back-up notes. Voice recordings were transferred to a computer as

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Word Media Audio files. Accompanying software allowed verbatim transcription (Halcomb and Davidson 2006) to a MS Word (2010) document.

Thirty-nine physiotherapists who did the community service year in 2011 or 2012 were invited to comment on the model. (Refer to Appendix N for the invitation e-mail, and Appendix O for the information distributed to them.) This model of the experiences of community-service physiotherapists served as point of departure for curriculum reform.

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### DATA ANALYSIS

Tesch's inductive, descriptive coding technique was applied to the interviews (Creswell and Plano Clark 2007). To increase the confirmability of the research, a psychology intern under supervision of a researcher with a PhD independently coded the transcripts (Thomas 2006). (Refer to Appendix P for the certificate and Appendix Q for the clause of confidentiality.) Six steps were followed: the coder obtained a sense of the whole by reading through the transcripts independently. Ideas that came to mind were jotted down. The coder then selected one interview and asked: 'What is this about?' thinking about the underlying meaning of the information. When the coder had completed this task for several respondents, a list was made of the topics. Similar topics were clustered together and formed into columns that were arranged into major topics, unique topics and 'leftovers.' (Refer to Appendix R for the coding matrix.) The coder returned to the data with the list and tried out a preliminary organising scheme to see whether new categories and codes emerged. The coder found the most descriptive wording for the topics and turned them into categories, then endeavoured to reduce the number of categories by grouping together related topics. The data belonging to each category was assembled in one place and a preliminary analysis performed.

In parallel, the interviewers did paper-based open coding of units of meaning (phrases/sentences/paragraphs), and 942 codes were generated. Codes with similar meanings were integrated and the number reduced to 75. The text was read again before codes were synthesised into 18 categories and four overarching themes. (Refer to Appendix S for an example of the categorisation of codes.) These two phases were followed by a discussion between the principal researcher and the independent coder to reach consensus.

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The categories were organised along the four steps of the appreciative inquiry process. As the categories according to the appreciative inquiry process provided the main themes for the final model, examples of quotations supporting the categories are given for these in tables 4.5 to 4.8.

The final phase of the data analysis was to integrate information from the four phases into one model. (See Appendix T and Appendix U for the first two versions of the model.) The third version is in Figure 4.1 on p. 16. E-mail responses from the 2010/2011 community service group were read and compared to the interview responses. Attention was given to possible information that contradicted the model.

### TRUSTWORTHINESS

This qualitative research was made robust by attending to the aspects of trustworthiness listed in Table 4.1.

Although the study period was approximately six months, the principal investigator has more than 15 years of experience of community-based physiotherapy, both as a manager at national level and as an educator responsible for community-based education. Reflexivity – “the explicit quest to limit researcher effects on the data by awareness of self” – was therefore important (Mcghee, Marland and Atkinson 2007: 334), which allowed for the researcher had to act continuously as an “interpretive bricoleur” (Denzin 2012: 85). For example, the research was open to be challenged by the more naïve independent student interviewer/coders. Thoughts were also discussed with critical friends from different professional fields (public health, education, nursing and sociology).

In addition, a telephone conference and a consultation meeting were held with the independent researcher and the research consultant, to gain consensus on codes, categories and themes, as another form of peer review.

**Table 4.1. Strategies used to ensure trustworthiness.**

Approach to rigour	Strategy	Application
<b>Credibility</b>	Valid, recognisable research methods	<ul style="list-style-type: none"> <li>• Interviews, qualitative data analysis following Tesch</li> </ul>
	Peer review	<ul style="list-style-type: none"> <li>• A telephone conference and a consultation meeting were held to gain consensus on codes, categories and themes</li> </ul>
	Member check	<ul style="list-style-type: none"> <li>• The model and discussion were verified by post-community service physiotherapists</li> </ul>
	Triangulation	<ul style="list-style-type: none"> <li>• Different interviewers were used</li> </ul>
	Early familiarity with the culture	<ul style="list-style-type: none"> <li>• Principal researcher works in a policy development capacity with community-based health delivery</li> </ul>
<b>Dependability</b>	Dense description of methodology	<ul style="list-style-type: none"> <li>• The methods and procedures are comprehensively described and can be repeated</li> </ul>
<b>Confirmability</b>	Audit trail	<ul style="list-style-type: none"> <li>• All the versions of the coding, and diagrams illustrating the development of the findings, were kept</li> </ul>
	Reflexivity	<ul style="list-style-type: none"> <li>• After the finalisation of the list of codes, the text was re-coded</li> <li>• Discussion with critical friends</li> </ul>
	Independent coding	<ul style="list-style-type: none"> <li>• Independent coding by research assistant from a research consultancy</li> </ul>
<b>Transferability</b>	Description of the sample	<ul style="list-style-type: none"> <li>• Various characteristics of the participants and background information about the context were described, making it possible for the reader to compare his/her context with that of this study</li> </ul>

Source: Lincoln and Guba (1985); Morse et al. (2002); Houghton et al. (2013); Thomas (2006)



## RESULTS

The sample (n=15) consisted of five males and ten females of whom two were African and 13 were Caucasian. Two were graduates from the University of Cape Town, two from the University of the Free State and 11 from the University of Pretoria. Six of the participants had done their community service year in 2008, six in 2007, two in 2006 and one in 2005. The seven participants who participated in the member-check process agreed with the model and provided further examples supporting the themes in the model. They were from the Eastern Cape (n=1), Gauteng (n=4), Kwa-Zulu Natal (n=1) and North-West (n=1). One male took part in the member check. Categories and sub-categories according to the appreciative inquiry framework are set out in tables 4.2 to 4.4. Tables 4.5 to 4.8 contain quotations supporting the final four themes that were included in the model (Figure. 4.1).

**Table 4.2. Theme – Appreciating: Overview of categories and sub-categories reflecting the physiotherapists’ experiences of their community year from an appreciative-inquiry stance**

Category	Sub-category
Physiotherapists expressed a sense of appreciation in terms of service delivery, productivity and unique contributing factors when working in a community setting.	<p>The most satisfying experience when working as a community physiotherapist:</p> <ul style="list-style-type: none"> <li>• Service delivery (in community and solving individual problems; sense of appreciation by members)</li> <li>• Making a difference</li> <li>• Community engagement and forming relationships</li> <li>• <i>‘experiencing a community culture’</i></li> </ul> <p>The productivity of community physiotherapists:</p> <ul style="list-style-type: none"> <li>• Ownership of physiotherapy</li> <li>• Being part of a team (with community caregivers and within a multi-disciplinary team)</li> </ul> <p>The unique contribution of the physiotherapist to bettering the patient’s wellbeing:</p> <ul style="list-style-type: none"> <li>• Education programmes informing the community               <ul style="list-style-type: none"> <li>- Adequate communication structures</li> <li>- Support structures</li> </ul> </li> </ul>

**Table 4.3. Theme - Envisioning/Dreaming: Overview of categories and sub-categories reflecting the physiotherapist experiences of their community year from an appreciative inquiry stance.**

Category	Sub-category
<p>Physiotherapists' envisioned a need to better contribute to the wellbeing of community members by improving the compulsory community year which includes the need for a better educational process, clearer identification of possible contributing factors (of the physiotherapist) as well as possibilities of improvement within the community.</p>	<p>Dream for ideal future community physiotherapy</p> <ul style="list-style-type: none"> <li>• Improved structures:             <ul style="list-style-type: none"> <li>○ Communication</li> <li>○ Management</li> <li>○ Supervision</li> <li>○ Transport</li> <li>○ Consulting rooms</li> </ul> </li> <li>• Better distribution and allocation:             <ul style="list-style-type: none"> <li>○ Funds</li> <li>○ Physiotherapists (in specific areas)</li> </ul> </li> <li>• Education programmes for community</li> </ul>

**Table 4.4. Theme - Design/Co-constructing: Overview of categories and sub-categories reflecting the physiotherapists' experiences of their community year from an appreciative-inquiry stance'**

Category	Sub-category
Physiotherapists voiced their concern with regard to the community year, which included a variety of challenges and identified important factors to consider in order to establish a valued-based, efficient community service.	<p>Challenges identified that might hinder the establishment of a valued-based community physiotherapy service:</p> <ul style="list-style-type: none"> <li>• Staff motivation</li> <li>• Payment structure (community and public)</li> <li>• Collaboration with important stakeholders</li> <li>• Language barriers</li> </ul> <p>Important factors to consider to establish a valued-based community physiotherapy service:</p> <ul style="list-style-type: none"> <li>• Procedures:               <ul style="list-style-type: none"> <li>- Continuous training programmes</li> <li>- Collaboration with:                   <ul style="list-style-type: none"> <li>○ Community caregivers</li> <li>○ Multi-disciplinary-team-member involvement</li> <li>○ Non-government officials</li> </ul> </li> </ul> </li> <li>• Multi-targeted target population (focussing more on the less fortunate)</li> <li>• Management and supervision structure</li> <li>• Distribution of funds</li> </ul> <p>Ensuring efficient community physiotherapy service</p> <ul style="list-style-type: none"> <li>• In collaboration with the multi-professional team and patients</li> <li>• Assessment and re-assessment</li> <li>• Mobile units (and transport)</li> <li>• Support groups</li> </ul>

**Table 4.5. Quotations in support of the categories of the theme ‘The essence of community physiotherapy’**

Theme	Category	Quotations <sup>a</sup>
The essence of community physiotherapy	- Principle: client- and community-orientated	- <i>You mustn't just think of physiotherapy when you're in a community here; you must think more widely; what life skills can you give to them. There are a lot of possibilities in that area and working in a disciplinary group ... it uplifts the community, because there's a lot of poverty and that's the main issue.</i>
	- Improved accessibility	- <i>So in order for you to enable [clients] to do their best, or ... that they can start to help themselves, you really assess the situation to what they need to get better.</i>
	- Focus on health education and counselling	- <i>You really have to consider the patient's needs before you can actually, well, treat the patient well.</i> - <i>I think ... also to ask the nurses in the clinics on what [conditions] they see a lot.</i>
	- Variety of clients, conditions	- <i>Community outreaches and speeches to schools ... Group discussions ... Group classes ... Activities of daily living, ... Educating.</i>
	- settings	- <i>Through the education programme you get possible ...solutions, and you know people can treat themselves [in future] if they have a problem.</i>
	- Underlying poverty	- <i>[The community care workers] let us know about vulnerable groups, because we did home visits, we did clinic visits.</i> - <i>Our biggest patient third was probably children with c[erebral] p[alsy]. It was purely because there was no antenatal medical management of the mothers, so ... the medical problem became our problem.</i>
		- <i>We found a lot ... of neurological patients [who] didn't know how to use crutches or didn't know how to use their wheelchairs correctly. A lot of them told us afterwards that 'shoo, they didn't even know all of these things.'</i>
		- <i>Disability ... Orthopaedics ... Diabetes ... High blood pressure ... Arthritis ... The Elderly ...</i> - <i>We were involved in home visits ... Clinics ... Schools ... Community health centres ... Hospitals.</i> - <i>You got to consider the vital factors like money, and the person being the only breadwinner, and like they can't take a day's rest, or else they don't get money.</i>

**Table 4.6. Quotations in support of the categories of the theme ‘Prerequisites for a positive practice environment’**

Theme	Category	Quotation
Prerequisites for a positive practice environment	- Effective management	- <i>Because at the moment [recommendations] usually [travel] only from top to bottom, and from bottom only to middle management [level]. [Recommendations] never reach top management with your needs.</i>
	- Basic infrastructure	- <i>Well, number one, the clinics are badly run, staffed, and stocked, as such. So walking frames and crutches ... are just not available. ... And also patients can't get transported.</i>
	- Accessibility of services	- <i>There is corruption. Lots of the funds don't get channeled to the right places. Like the hospital takes a lot of the funds and - the people of the community - it doesn't really reach them.</i>
	- Discipline-specific supervision and mentoring	- <i>We wanted to start [new services], but the region and the managers, they didn't want us to.</i> - <i>You must have the basic things like, hot packs, interferential [machines], and also ... posters in the community's mother tongue.</i> - <i>I would think a ... computer admin[istrative] system that logs patient [visits].</i>
	- Equitable distribution of therapists	- <i>'Physios' that went to Limpopo ... [were] sent on courses that the Government paid for, but the people that were put in [Johannesburg] Gen[eral] and Barra[gwanath], weren't even allowed leave [for courses]. So it is unequal.</i> - <i>A work area that is big enough to either see a group of people to give group classes, or just have a plinth ... to see individual patients. It's just the space is very small; they give you ... this corner where only one patient can fit in.</i> - <i>I would recommend mobile units.</i> - <i>Vehicles that can travel ... dirt and gravel roads because a lot of the times we couldn't get to clinics due to a car that just couldn't handle the roads.</i> - <i>More supervision ... I would have liked.</i> - <i>I think in some areas you have an over saturation of community physiotherapists and in some areas you don't; and it's all ... mediated by the government, where they put their people, so I think, if they could just better distribute the people.</i>

**Table 4.7. Quotations in support of the categories of the theme ‘The collaborative nature of community physiotherapy’**

Theme	Category	Quotation
The collaborative nature of community physiotherapy	- Taking hands	- <i>Physiotherapy [as] one professional group is not going to solve a community’s problems; just because there’re different scopes of problems and you need different people to solve those problems at different levels.</i>
	- Ignorance about physiotherapy role	- <i>The community health workers, they basically indicated vulnerable populations. They’d come to us and say, ‘Listen, there’s a school for [children with] special needs ..., don’t you guys want to come and assess [the children]?’</i>
	- Language a common barrier	- <i>So a lot of collaboration has to be done in the community; it’s not just one profession that can meet the needs of the community.</i>
	- Preventing professional isolation	- <i>We collaborated a lot with the people-with-disabilities organisations.</i>
		- <i>The people are ... very grateful and willing to come ... to the clinic. To make it ... easier for them, well, we all go as a ‘rehab[ilitation]’ team. So that’s quite productive, and everyone sees all the patients there at the same time.</i>
		- <i>And the other thing is the understanding of the community ‘towards us’: it was really, really a big problem.</i>
		- <i>That is the first thing that you must do, enlighten. Let the people know who you are, what so you do, and how you can help them.</i>
		- <i>You know a lot of people still don’t understand the difference between physiotherapy and occupational therapy.</i>
		- <i>The doctors - we study with them in first and second year - and they kind of forget that we have ... a good medical background in terms of pharmacology, physiology and an understanding of pathology.</i>
		- <i>I think the language barrier - even though in the hospital you are provided with interpreters - was difficult.</i>

**Table 4.8. Quotations in support of the categories of the theme ‘Community physiotherapy as a gateway to personal growth and professional development’**

Theme	Category	Quotation
Community physiotherapy as a gateway to personal growth and professional development.	- Identify formation strengthened by positive client feedback.	- <i>The people are very grateful.</i>
		- <i>We can actually make a difference ... We ... offer health services [to those] that can't really afford it.</i>
		- <i>We make a huge impact; ... you learn from the patients.</i>
	- An acquired taste	- <i>So I find that very exciting: the challenges that you are faced with.</i>
		- <i>There was no highlight! I didn't enjoy it AT ALL!</i>
	- Demands and difficult conditions harnessed by positive personal characteristics	- <i>I'd have to say ...I think if you're really motivated, you can really make it awesome.</i>
		- <i>You get thrown into the deep end and... that is quite exciting; learning to find your feet and having to start - you know - use everything you've got. But still, it's always unpredictable, always having to adapt and change and there's always a challenge. So that was definitely very nice.</i>
	- Gradual improvement in skills	- <i>Focusing on what your goal is for that specific time and ... even if there is bad moments. Just keep on going ahead, you know, and pick up and go again.</i>
		- <i>The thing is that when we were at [university], we thought of physiotherapy in some way, but when you start to see the physiotherapy in the real world, I think that is a bigger challenge.</i>
	- Familiarity with clients' living conditions facilitates appropriate, insightful intervention	- <i>I think ... it's a year that you gain a lot of experience.</i>
		- <i>The positive thing that I have learned about the community is responsibility. .. I feel like I had 'a leap in my life.'</i>
		- <i>You can't rely on ... resources, so you use what you have, and you are lots more innovative.</i>
		- <i>How to treat patients, how to communicate with patients; what works best, what doesn't work. As you progress through the year, you get better and better at what you do. So in the beginning it's a bit of a struggle.</i>
- <i>The fact that you get to see the environment the people live in, and therefore you have better insight into exactly, the home environment, and ... the living setting of the person.</i>		
- <i>Getting to know the people, seeing ... the cultures and leaning the different [languages].</i>		



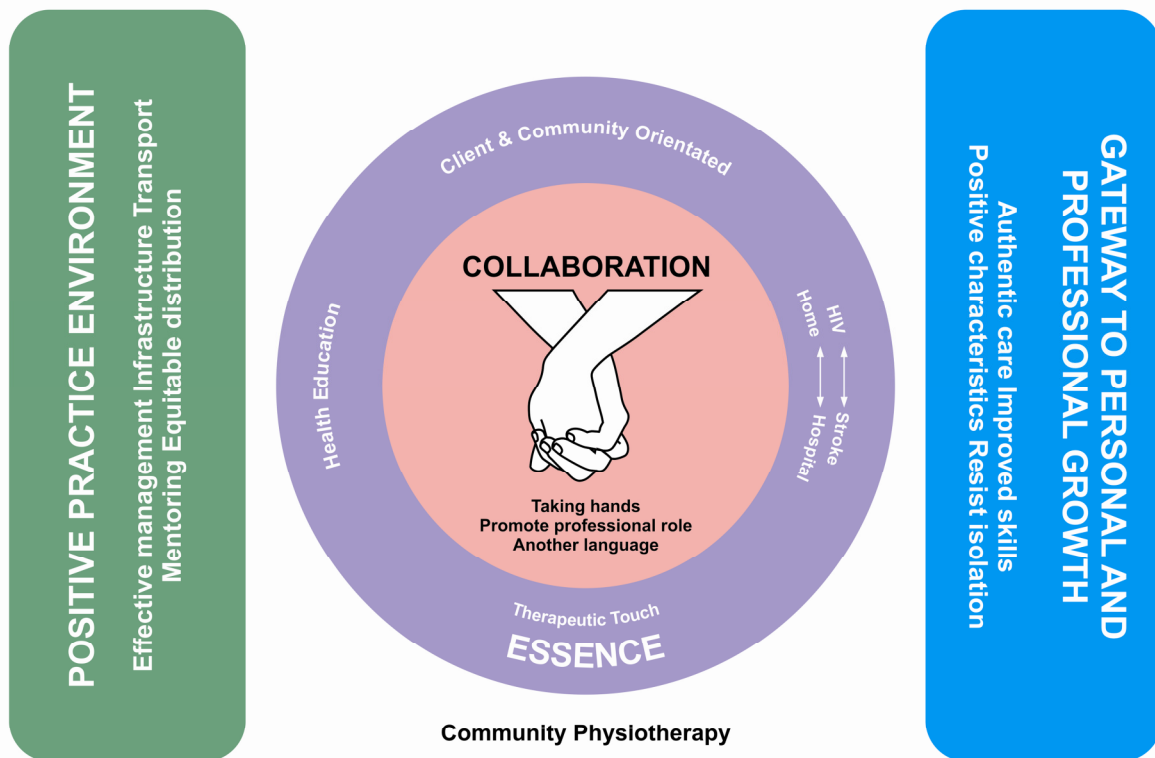


Figure 4.1. Model for compulsory community physiotherapy

## DISCUSSION

With the aim of informing the undergraduate physiotherapy curriculum, the study explored the experiences of newly graduated physiotherapists during a compulsory community-service year. The findings were integrated into a four-part model: (1) the essence of community physiotherapy; (2) the collaborative nature of community physiotherapy; (3) prerequisites for a positive practice environment, and (4) community physiotherapy as a gateway to personal growth and professional development. The model is now discussed in relation to the studies referred to in the introduction. A description of limitations of the study is followed by implications for the curriculum.

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### THE ESSENCE OF COMMUNITY PHYSIOTHERAPY

Compulsory community service in physiotherapy provides comprehensive care in a variety of settings, from homes, clinics and schools to hospitals. In addition a wide spectrum of conditions is treated, from HIV to pregnancy, and over the lifespan of clients. Community physiotherapists act as generalists, treating conditions that reflect the country's quadruple burden of disease (Groenewald et al. 2012). They perform common community physiotherapy services (Maleka et al. 2008). Health education and health promotion are prioritised in line with global and national policies.

Clients experience the services as beneficial. Therapeutic touch, for example, is used – also by other therapists (Ventegodt, Morad and Merrick 2004). Physiotherapists reported that services are orientated towards the needs of clients. In community-service physiotherapy, the holistic team addresses broader issues than physical health – specifically poverty. Where speech-and-language therapy professionals felt that contextual issues like poverty fell outside their scope of practice (Penn, Mupawose and Stein 2009). Physiotherapists acknowledged them as matters to be dealt with by the health-care team. Physicians working in South Africa similarly report the desire to improve health care despite the underserved context (Burch et al. 2011).

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### THE COLLABORATIVE NATURE OF COMMUNITY PHYSIOTHERAPY

Collaboration, the backbone of community physiotherapy, is impaired as a result of the lack of awareness about physiotherapy's role in patient care and public health. Amongst others, doctors and members of target communities are ignorant about physiotherapy and other professions (Paterson et al. 2007). The inability to understand or speak the language of the communities where the community service physiotherapists are placed also hinders collaboration, as voiced in similar studies (Visser et al. 2006).<sup>13</sup> To overcome this barrier, physiotherapists should learn some phrases in the local language and work with interpreters.

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## A POSITIVE PRACTICE ENVIRONMENT

Some factors need to be in place to facilitate a positive working experience in the community setting (Drenkard and Swartwout 2011). These factors include effective management, sufficient infrastructure, equitable distribution of physiotherapists between different areas, and the availability of transport to both health professionals and clients. Findings from community medical doctors, dentists, speech-language-and-hearing therapy professionals and dieticians are in agreement (Naidoo and Chikte 2002; Visser et al. 2006; Penn et al. 2009; Frehywot et al. 2010).

As part of a positive working environment the community service physiotherapists voiced a need for discipline-specific supervision and mentoring. Again this longing for professional support is not uncommon in health professionals (Grobler et al. 2009). A mentoring programme is indeed a pivotal component in continuous learning and for improved services (Moss et al. 2006).

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## COMMUNITY PHYSIOTHERAPY AS A GATEWAY TO PERSONAL GROWTH AND PROFESSIONAL DEVELOPMENT

Several factors contribute to the growing sense of being a professional physiotherapist. One factor is positive feedback from clients who see the physiotherapist as a helpful, significant team member. Getting familiar with clients' living conditions during home visits also facilitates appropriate, insightful authentic intervention, another hallmark of professionalism.

On the path to increased professionalism, personal characteristics such as resilience, creativity and perseverance assist in overcoming difficult demands and conditions. Responsibilities are initially challenging, but skills improve gradually (Penn et al. 2009). The five-stage model of the acquisition of mature skills succinctly explains the progression from being a rule-dependent novice to an expert who can draw on a collection of distinguishable situations and solutions (Dreyfus 2004). During compulsory community service, improved functioning as a professional therapist is also reinforced through teamwork. Other team

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members are a resource, prevent professional isolation, and discussions improve clinical decision making (Seright 2011).

However, not everyone enjoys the compulsory service year. Only 35% of rehabilitation therapists who did compulsory community service in KwaZulu-Natal during 2005 would choose to apply for work in the public sector (Khan et al. 2009). Nevertheless, the compulsory community-service year has had a positive influence on a majority of graduates' views of community work and a keener sense of social responsibility (Seright 2011; Mostert-Wentzel et al. 2012).

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### LIMITATIONS

Although this study contributes to the relatively under-represented body of research about health sciences education in Africa, the findings can cautiously be generalised only to compulsory community-service physiotherapy in South Africa. This is because purposive and snowball sampling was used to get a variety of participants and therefore opinions; however, not all the universities and provinces were represented in the sample. However, implications for the curriculum would be relevant to allied health educators, not only in developing countries, but also where practitioners work in taxing circumstances, such as deep rural and remote healthcare services, like in Scotland, Canada and Australia, or in the public sector in general.

The study would have benefited from more vigorous triangulation, attending to data-, investigator-, theory- and methods triangulation (Denzin 2009). Data triangulation would have been richer if more sources were used, for example if interviews were also conducted with final year physiotherapy students. Data triangulation over time could have been achieved if the same interviewees were re-interviewed a few weeks after the first interview. Further data analysis – in terms of person – could be achieved if the population was expanded to include fourth year physiotherapy students from the eight university physiotherapy departments in South Africa. Additional methods to semi-structured interviews could include in-depth interviews, and focus group interviews and group discussions, especially if combined with investigator triangulation. Although three interviewers conducted the interviews, they were from the same gender, culture and level

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of physiotherapy experience. Their younger age privileged the interviewees in terms of age. The use of more experienced and culturally diverse interviewees may have enriched the data. Possible interviewers would be senior clinicians, managers and educators. Furthermore, an attempt to find more theories to explain the findings could have been done.

At the time of this fieldwork the researcher applied limited reflexivity. Chiseri-Strater (1996: 130 in Pillow 2003: 177) distinguishes between reflexivity and reflection: “to be reflective does not demand an ‘other,’ while to be reflexive demands both an other and some selfconscious awareness of the process of self-scrutiny.” “This focus requires the researcher to be critically conscious through personal accounting of how the researcher’s self-location (across for example, gender, race, class, sexuality, ethnicity, nationality), position, and interests influence all stages of the research process” (Pillow 2003: 177).

An explicit reflexive diary and the writing of detailed methodological memos would have improved the credibility of the findings further. In a similar vein participants’ voices would have been clearer if pseudonyms were used with quotations in the text itself and not only in tables. Mauthner and Doucet (2003) practically recommend the voice-centred relational method of data analysis (Brown 1994: 392), where the researcher first reads a new text as “herself” and documents her responses and emotions. Pillow (2003: 175) discusses the “four common trends in present-day uses of reflexivity: reflexivity as recognition of self, reflexivity as recognition of other, reflexivity as truth, and reflexivity as transcendence.” The author warns against comfortable uses of reflexivity, which clearly show failure or success of claims of representation of the truth.

Another strategy to improve the credibility of the research would be (Shenton 2004) to use grounded theory and its continuous comparable method (Bitsch 2005). For example, iterations of theoretical sampling of iterative was not undertaken in the current study. In addition, formal debriefing sessions between the researcher and superiors (e.g. study leaders) needed to be scheduled.

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## IMPLICATIONS FOR THE CURRICULUM

First, to be prepared for the nature of community-service physiotherapy, undergraduate physiotherapists must be exposed to a complex healthcare environment, in different settings, treating common conditions and risk factors contributing to the local burden of disease. A thorough understanding of social justice and the determinants of health, including poverty, is essential (Redman and Clark 2002).

Hands-on clinical skills in physiotherapy were highlighted as being important. These clinical skills should therefore not be neglected in the quest of producing health promoters; however important the latter (Hanafin and Cowley 2006).

Second, the collaborative nature of community physiotherapy implies that students must be exposed to interprofessional teams, as well as to role players in other sectors than health, like organisations for disabled people. Because collaboration requires knowledge of the roles of colleagues, graduates must be comfortable with promoting their profession while understanding the contribution of other professions. Working with different cadres of workers is another essential collaboration skill.

Cultural proficiency is also essential for collaboration in community-service physiotherapy. Incorporating a local language in the undergraduate curriculum has the potential of improved collaboration with clients and staff. Equally important is training in cultural competence and awareness of the social determinants of health to shape interventions (Kaufman et al. 2010).

Third, to foster a positive work environment, new graduates should set out to find a mentor, even in the absence of a formal mentoring system. Students should, for example, be familiar with systems that are already in place, like the South African Society of Physiotherapy 'buddy' system, where qualified physiotherapists are paired, even if only via telephone, with new graduates. Comparable studies, mentioned earlier, make recommendations for better management to improve the practice environment during compulsory community service. Whilst instilling sound management and leadership principles in students themselves, they should be prepared for far less than optimal working circumstances.

## Chapter 4. Community physiotherapy model

Fourth, therefore, undergraduate education should foster resilience as part of professional development. Resilience is described as the ability ‘to remain positive despite adversity’ (Dyrbye and Shanafelt 2012). Howe, Smajdor and Stockl (2012) suggest various strategies to facilitate resilience in undergraduate students, which range from goal setting to reflection on practice. When practising doctors and medical students use constructive coping mechanisms – problem-solving, reframing, finding meaning in their work, striving to maintain a work-life balance, and identifying and focusing on their values and priorities – they are at lower risk for burnout (Shanafelt et al. 2012).

Service-learning as an experiential andragogy is valuable for professional development (Geppert et al. 2011), and cultural competence (Schim et al. 2007). Service-learning placements can also contribute to better understanding of health disparities and the interrelatedness between health and poverty (Proctor et al. 2010).

In-service-learning students deal with real community needs in a reciprocal relationship. Reflection, an essential element of service-learning, takes on different forms, like personal and group journals, discussions, group discussion that include community members, visual and oral presentations and even creative fine art artefacts (Eyler 2002; Schippers et al. 2003). In this way the attribute of life-long learning is fostered (Proctor et al. 2010).

Although these topics are common in health sciences education, uptake into curricula had been variable. All physiotherapy university departments in South Africa, for example, have gaps in their community and public health curricula.

Detail on topics and other standards for the curriculum derived from the model is provided in Chapter 7.

### CONCLUSION

This exploration contributes to the clarification of the essence and the collaborative nature of physiotherapy in public health, the prerequisites for such physiotherapy, and the contribution to the professional development and personal growth of newly qualified physiotherapists. Reflection incorporated into service-learning clinical placements could contribute to prepare students for real-life work settings. Chapter 5 deals with the

## Chapter 4. Community physiotherapy model

expectations of stakeholders about competencies of physiotherapy students by the end of the undergraduate programme.



## 5. CORE COMPETENCY FRAMEWORK

*The conception of education as a social process and function  
has no definite meaning until  
we define the kind of society we have in mind.*

John Dewey

### INTRODUCTION

This chapter addresses the second research objective: “To clarify the expectations of stakeholders about the standards for undergraduate community physiotherapy education.” The chapter describes the background, the development and procedures of the Delphi study, its findings and implications. A competency framework for community physiotherapy that has implications for the whole curriculum, and not only community physiotherapy, is described.

### BACKGROUND

The worldwide move in health sciences education is towards competency-based curricula (Frenk et al. 2010). “Competence” and “competency” can be used interchangeably and mean to be “suitable or sufficient for a purpose” (2001). “Competent performance expectations reflect the requisite knowledge, skills, and abilities expected throughout a [health professional’s] career” (Canadian Association of Occupational Therapists 2007; Accreditation Council for Canadian Physiotherapy Academic Programs et al. 2009: 7), ‘necessary for job performance to the appropriate standard’ (Queensland Health and Griffith University 2006).

At a programme level, general competencies are often formulated as broad professional roles, such as that of a clinical expert or health advocate (Mickelson and Macneily 2008). Ten Cate and Scheele (2007) argue that these roles are not automatically recognised, because the competencies they represent are general. Competencies can therefore be described by a limited number of entrusted professional activities (Ten Cate and Scheele

2007). Different professions have expanded and developed similar competency frameworks (Speech Pathology Australia 2001; Australian Association of Social Workers 2003; Pharmaceutical Society of Australia 2003; Australian Physiotherapy Council 2006; Accreditation Council for Canadian Physiotherapy Academic Programs et al.; Barry et al. 2009; General Medical Council (United Kingdom) 2009; National Physiotherapy Advice Committee 2010; Chartered Society of Physiotherapy c.2012).

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## COMPETENCY MODELS

Lin, Beattie, Spitz and Ellis (2009) reviewed a number of competency models developed by different professionals from different countries to develop a framework specifically for professionals working in remote and rural areas in Western Australia. They investigated three groups of competencies: (1) generic (shared by all but not specific to health service provision – e.g. leadership and management, communication and interpersonal skills); (2) health professional competencies (shared by all or by a specific subset, like allied health); and (3) technical (e.g. profession-specific competencies). All three of these categories are useful in competency frameworks. The Clinical Prevention and Population Health Curriculum Framework (Finkelstein et al. 2008; Maeshiro et al. 2011; Zenzano et al. 2011), on the other hand, addresses the increased emphasis on population-health care. This framework has been adapted and tested for professionals, including those in medicine (Kerkering and Novick 2008) and nursing (Allan et al. 2005). No study where allied professionals used the Clinical Prevention and Population Health Curriculum Framework was found.

The body of knowledge supporting performance competencies in the developed world is emerging. A literature search (2002 to October 2012) did not yield similar frameworks in African or other developing regions. The search was conducted of the databases Cinahl, Medline and Google Scholar, using the terms “allied health”, “physiotherapy”, “competency” and “performance standards”. Owing to the gap highlighted, this study set out to develop a competency framework, specifically for physiotherapy, involving various stakeholder groups.

## METHODS

## STUDY DESIGN

An e-Delphi study (from this point referred to as a “Delphi”) was considered an appropriate design to reach reliable consensus from diverse stakeholder groups and utilised collective intelligence (Hasson, Keeney and Mckenna 2000; Okoli and Pawlowski 2004). Linstone and Turoff (2002: 5) proposed the following view of the Delphi, summarising both the technique and its objective: “Delphi may be characterized as a method for structuring a group communication process, so that the process is effective in allowing a group of individuals, as a whole, to deal with complex problems.” The design was design was pragmatic and sought to find a useful answer about the core competencies needed in undergraduate physiotherapy curriculums (Biesta 2010).

The method consists of iterative rounds of questionnaires completed by informants knowledgeable about the topic and anonymous to each other (Rohan et al. 2009) (Lazarou et al. 2011). Usually the first round is used to generate items for subsequent rounds (Cegielski 2008). The benefits of this method are the effectiveness and efficiency of including panellists from a wide geographical area and with diverse experience (Jenkins, Mash and Derese 2012). Owing to the anonymity more dominant and senior panellists cannot influence more introverted ones (Hsu and Sandford 2007). Earlier studies have shown that in this way a group tends to reach more accurate conclusions than individuals do (Franklin and Hart 2007). However, on the down side anonymity can lead to hasty decisions due to the absence of accountability (Powell 2003). The Delphi is widely used, also in modified forms, in different fields, including health research and education (Gupta and Clarke 1996; Flynn and Verma 2008; Mcleod et al. 2009; Ross and Loke 2010; Valani et al. 2010; Wesselink et al. 2010). In this study two rounds were sufficient to reach consensus on competencies. Following the identification of core competencies, the applicability of the competency framework was tested at two workshops, one with the Department of Physiotherapy and one with the Department of Education Innovation, both at the University of Pretoria.

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## SETTING

Data were collected in 2012 from healthcare professionals working mainly in the public sector. Clinicians and managers from all nine provinces and the eight universities that educate physiotherapists were recruited. Health care workers function as far as possible in inter-professional teams. As team members they share common roles and functions in addition to those particular to a specific discipline, especially in community- and population-health settings. So, although mainly physiotherapists were panellists in this study, the work setting is similar to that of other rehabilitation disciplines in other developing and even developed countries, like the National Health System in the United Kingdom.

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## PANELLISTS – SAMPLE SIZE

A minimum of ten panel members is recommended (Bulger and Housner 2007). For this study some key panellists were identified, but the opinion of a larger group was sought as explained in the next subsections. The whole physiotherapy staff and the two education consultants responsible for the Department of Physiotherapy participated in the applicability workshops held on three occasions at the Faculty of Health Sciences of the University of Pretoria.

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## ROUND 1

For this study, those knowledgeable about community-based physiotherapy were identified as physiotherapists busy with a year of compulsory community service post-graduation, senior clinicians, rehabilitation managers from different ecological levels and educators. A convenient population framework that included all these groups was the member list of the Health Professions Council of South Africa (HPCSA). This institution unfortunately could only provide postal addresses. Therefore, we asked the South African Society of Physiotherapy (SASP) for an e-mail list of its members (n=3 692). Although not everyone registered with the HPCSA is a member of the SASP, we assumed that the latter organisation's members would tend to be more involved in professional issues than non-members.

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## ROUND 2

Panellists (n=252) for the second round were purposively selected from the same stakeholder groups as round 1. The National Department of Health provided the contact details of provincial managers and those therapists who were busy with their compulsory community-service year. Physiotherapists in their first year post graduation were an important source of information as they were acutely aware of where they experienced gaps in their knowledge base. Only community-service physiotherapists who were based outside of the main centres were invited. Snowball/chain sampling was employed to identify physiotherapists working in rural and remote areas and in non-governmental organisations. Furthermore, physiotherapists who had attended the World Confederation of Physical Therapy summit on global health in 2011 were invited via e-mail.

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## DELPHI SURVEY INSTRUMENTS

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### ROUND 1

The questionnaire comprised three sections: one to test a definition of community physiotherapy, a second to define roles and functions of physiotherapists working in community settings through open-ended questions, and a third to describe the demographic profile of panellists. The principal inquirer developed a comprehensive definition of community physiotherapy from the literature in related professions and asked panellists to improve this definition by reformulating, adding and/or deleting sections. (Refer to Chapter 1 for the original definition.) Section 2 consisted of open-ended questions about ideal roles and functions and, in Section 3, participants could select options from lists or drop-down menus about work setting, main professional role, level of education, and status of community service (refer to Appendix C for the survey instrument). These variables were assumed to have an impact on participants' views about the functions and roles of community physiotherapists. Level of education, for example, would give an indication of whether post-graduate studies were undertaken. People involved in post-graduate studies are probably more in touch with new developments in the profession.

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## ROUND 2

The survey instrument for round 2 consisted of two sections: a demographic section and a section with statements representing performance competencies in eight domains or professional roles. (See Appendix D.)

Items for the competency section were developed from findings from: (1) a document analysis of community physiotherapy curricula of the eight universities in South Africa (refer to Chapter 3); (2) semi-structured telephone interviews with 12 physiotherapists who were busy with, or had completed, a year of compulsory community service in the preceding four years (Mostert-Wentzel, Frantz and van Rooijen 2013b) (refer to Chapter 4.); and (3) responses to the section of the round-1 questionnaire about the roles and functions of a community physiotherapist. Responses to the pre-formulated definition of community physiotherapy were coded and the definition was adapted and refined accordingly. (Refer to Box 1.1 for the original definition and to Appendix V for the list of codes used in this step.) Framework analysis (Saldana 2009) was applied to transcripts of the interviews and round-1 data set using the Clinical Prevention and Health Promotion Curriculum Framework (Allan et al. 2005). This framework has four domains – i.e. evidence-based practice, clinical prevention/health promotion, health management and health policy, and population health and community aspects of health care. According to framework analysis, these domains were used as categories, and their subsections as codes, in the analysis.

This process finalised the 99 statements for the round-2 questionnaire. Performance competency statements were presented on a 6-point Likert scale with options ranging from “strongly agree” to “strongly disagree”. The scale also had an option for “do not know/not applicable.” Panellists were also invited to give additional comments. These comments are integrated into the discussion to enlighten the findings.

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## MODE OF ADMINISTRATION

Surveys for both rounds were administered via the commercial survey-management system, SurveyMonkey. The link to the survey for round 1 was available in an e-newsletter

distributed by the SASP. For round 2 the link was e-mailed via Survey Monkey to the personal e-mail address of each panellist.

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#### PILOT STUDIES

Both the phase-1 and phase-2 instruments were piloted with two statisticians, two team members with PhDs, and other healthcare professionals, fellows and faculty members of an African institute that promotes health sciences education (SAFRI)<sup>3</sup>. The professions of those who piloted the questionnaire were a medical sociologist, a public health nurse, health sciences education consultants, physiotherapists, medical doctors and a psychologist. The pilot led to improvements in formulation of the items, in better instructions to panellists for questions, and in additional options to some questions.

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#### ETHICAL CONSIDERATIONS

The study received clearance from the University of Pretoria, Faculty of Health Sciences Ethics Committee (No 12/2010) (Appendix M). Panellists gave informed consent in their personal capacity.

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#### PROCEDURES

The link to the round-1 survey was made available in the SASP e-newsletter till deleted by a panellist. The principal inquirer phoned key participants like educators from the eight universities after one week to request their participation. The Survey Monkey™ collector was closed after four weeks. (See Appendix W for the invitation e-mail linked to the SASP e-newsletter.)

Each panellist received an e-mail invitation a week before the distribution of the link to the round-2 survey, apart from those who were busy with their compulsory community-service year. (See Appendix X.) The principal inquirer and a research assistant phoned the latter group individually to explain the study and obtain e-mail addresses of those willing to

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<sup>3</sup> Sub-Saharan African Faimer (Foundation for the Advancement of Medical Education and Research) Institute. Faimer advances health sciences education developing countries and is based in Philadelphia, USA.

participate. A sample of non-responders was telephonically reminded about the survey after a week. The survey stayed open for six weeks.

The inquirer presented the competency framework and an outline of a draft meso-curriculum for discussion and evaluation by the staff members during applicability workshops.

## STATISTICAL ANALYSIS

To show the profile of the panellist, descriptive statistics were applied to the following variables: gender, work setting, level of education, professional role and community service experience. The reliability of the instrument was tested by calculating the Cronbach's  $\alpha$  reliability coefficient for each competency domain (section of the questionnaire) and for the questionnaire overall (George and Mallery 2003).

To determine consensus, the percentage of panellists who scored 4 and 4+ on the Likert scale was calculated. Consensus was calculated by considering the proportion of subjects with a Likert scale score of 4 ("agree") and 4+ (up to "strongly agree") for each of the competency domains (clinical prevention, population health, health systems and health policy, population health, aspects of community practice, clinical practice, evidence-based practice, communication and collaboration and professionalism) and for each item, expressed as percentages. The *a priori* level of consensus was set at 70%+. Boxplots of the average score by competency domain were drawn. The strength of agreement was interpreted according to the norms or benchmarks set by Landis and Koch (1977).

## RESULTS

### PANELLISTS

Tables 5.1 and 5.2 present the characteristics of the panellists. No males participated in the first round. The number of panellists with a PhD degree was higher in round 2. Managers did not take part in round 1. The proportion of clinicians was less in round 2 than in round 1.



**Table 5.1. Profile of the panellists by gender and level of formal education**

Characteristics	Round 1 (n=70)	Round 2 (n=110)
	Count (%)	Count (%) <sup>a</sup>
<b>Gender</b>		
Female	38 (54)	71 (65)
Non-response	32 (46)	11 (10)
<b>Level of education</b>		
Certificate/Diploma	1 (3)	4 (4)
Bachelor's degree	26 (68)	57 (52)
Masters	10 (26)	25 (23)
PhD	1 (3)	14 (13)
Non-response	32 (46)	10 (9)

<sup>a</sup> Rounded

**Table 5.2. Profile of panellists in terms of work role, setting and community service status**

Characteristics	Round 1 (n=70) (%)	Round 2 (n=113) (%)
<b>Main professional role</b>		
Clinician	27 (64)	42 (38)
Manager	0 ( 0)	17 (16)
Educator	8 (21)	22 (20)
Researcher	1 ( 3)	5 ( 5)
Other	3 ( 8)	15 (13)
Non-response	31 (44)	9 ( 8)
<b>Level of management</b>		
Department	.	34 (31)
Hospital	.	14 (13)
District	.	12 (11)
Region	.	6 ( 6)
Province	.	24 (22)
National	.	6 (6)
Non-response	70	14 (13)
<b>Work setting<sup>a,b</sup></b>		
Government department	3 (3)	2 (1)
Hospital	44 (39)	10 (9)
Private practice	35 (31)	10 (9)
University	15 (13)	15 (14)
Community	3 (3)	41 (37)
Disabled People Organisations	0	24 (22)
Others	14 (12)	8 (7)
<b>Community service status</b>		
Busy with	0	17 (16)
Completed	23 (59)	22 (20)
Not done	16 (41)	47 (43)
Not applicable	0	13 (12)
Non-response	39 (56)	11 (10)

<sup>a</sup> Current and previous; <sup>b</sup> More than one option could be selected

## ROUND-2 QUESTIONNAIRE: VALIDITY AND RELIABILITY

The questionnaire had good to excellent reliability as shown in Table 5.3 (Streiner 2003). The Cronbach's  $\alpha$  reliability coefficient for two of the sections was above 0.8 and the rest, as well as for the questionnaire overall, were above 0.9.

**Table 5.3. Reliability of the questionnaire by competency domain**

Competency domain section	No of items	$\alpha^*$
Clinical prevention/Health promotion	7	0.85
Health systems an health policy	28	0.96
Population health	11	0.96
Aspects of community practice	15	0.95
Clinical practice	3	0.84
Evidence-based practice	8	0.92
Communication and Collaboration	15	0.95
Professionalism	12	0.95
<b>Overall</b>	<b>99</b>	<b>0.99</b>

\*Cronbach's reliability coefficient

As seen in Table 5.4, the percentage of agreement or consensus (4 or 4+ Likert score) was the highest for the domain clinical practice and lowest for health systems and health policy, public health and community aspects of practice.

**Table 5.4.** Summary statistics for the percentage of participants with a Likert score of 4 and 4+ <sup>a</sup>

Domain	N	Mean (%) <sup>b</sup>	Standard error	95% CI <sup>c</sup>
Clinical practice	105	86	3.0	63;96
Professionalism	97	85	2.2	81; 90
Communication and collaboration	98	80	2.6	75; 85
Evidence-based practice	92	79	2.8	74; 85
Clinical prevention and health promotion	102	73	2.8	68; 79
Public health	85	67	3.2	61; 74
Community practice	95	65	3.3	59; 72
Health systems and health policy	105	62	3.1	56; 68

<sup>a</sup> The Likert scores of 4 and 4+ indicate agreement with the performance competency statements; a higher score means more agreement; <sup>b</sup> Column ordered by the mean percentage; <sup>c</sup> CI means confidence interval.

Findings from round 1 were used to develop the round-2 questionnaire. Of the 99 performance competencies, 65 reached the *a priori* level of consensus of 70%+. Examples of

## CHAPTER 5. Competency framework

the retained and omitted performance competencies are shown respectively in tables 5.5 and 5.6. The revised definition of community physiotherapy is set out in Box 5.1. Table 5.7 gives the properties and dimensions of community physiotherapy derived from the round 1 findings.

**Table 5.5. Competency domains, professional roles and examples of performance competencies with consensus**

<p><b>Clinical practice: <i>Physiotherapy clinician</i></b></p> <ol style="list-style-type: none"> <li>1. Facilitate the achievement of optimum patient independence</li> <li>2. Identify and use the most appropriate interventions and techniques based on the findings of assessment, social context, pathology and evidence for practice</li> </ol>	<p><b>Professionalism: <i>Professional</i></b></p> <ol style="list-style-type: none"> <li>1. Reflect on her/his own values, beliefs and actions and identify goals for personal development</li> <li>2. Comply with policy, regulatory and legal requirements; e.g. registration with the local statutory body</li> <li>3. Employ the values of professionalism, like altruism and commitment to serve society, and ethical and moral standards in providing physiotherapy</li> </ol>
<p><b>Communication and collaboration: <i>Communicator and collaborator</i></b></p> <ol style="list-style-type: none"> <li>1. Communicate with clients and families in a respectful way, and involve them in decision making, get informed consent before and during interventions</li> <li>2. Interview and counsel clients effectively during a consultation in settings like the client's home</li> <li>3. Communicate effectively with clients with low levels of health literacy</li> </ol>	<p><b>Evidence-based practice: <i>Scholar</i></b></p> <ol style="list-style-type: none"> <li>1. Find and use different types and sources of physiotherapy-, health- and disability data</li> <li>2. Evaluate research based on the samples, methods, presentation of data and analysis to identify effective, beneficial physiotherapy practice</li> <li>3. Implement recommendations from evidence-based clinical guidelines on clinical prevention, community and population-based physiotherapy</li> </ol>
<p><b>Clinical prevention/Health promotion: <i>Health promoter</i></b></p> <ol style="list-style-type: none"> <li>1. Facilitate self-responsibility for health</li> <li>2. Conduct education and training in different formats to different target groups</li> <li>3. Counsel patients to adopt healthy behaviours, e.g. using brief motivational interviews, counselling and tele-health skills</li> </ol>	<p><b>Population health: <i>Population health practitioner</i></b></p> <ol style="list-style-type: none"> <li>1. Monitor health status to identify physiotherapy-related community health problems</li> <li>2. Diagnose and investigate health problems and health hazards in the community</li> <li>3. Assess community strengths and needs, and map assets</li> </ol>
<p><b>Community practice: <i>Community developer/ Change agent</i></b></p>	<p><b>Health systems and health policy: <i>Leader and manager</i></b></p>

## CHAPTER 5. Competency framework

1. Explain and use the ICF.<sup>b</sup>
2. Be responsive to the special needs of the South African population, especially those with disabilities, when managing physiotherapy services.
3. Explain and address the impact of disability in different environments and the constraints that it imposes on clients, their families and communities

1. Understand and fulfil his or her role as physiotherapist in primary health care and the structures of the public health and district system.
2. Facilitate the set up and manage clinical health services for individuals and populations, balancing individual and population needs: home programmes, physiotherapy departments (in clinics and hospitals), rehabilitation facilities, long-term facilities, CBR<sup>c</sup> programmes, community-based rehabilitation programmes, mobile services, satellite screening, clinic, palliative care

<sup>a</sup> 70% or more participants allocated a 4 or 4+ on the Likert score for these performance competency statements.

<sup>b</sup> ICF means International Classification of Functioning and Health.

<sup>c</sup> CBR means Community-Based Rehabilitation.

**Table 5.6. Competency domains, professional roles and examples of performance competencies that were omitted<sup>a</sup>**

<b>Community practice</b> <b><i>Change agent</i></b>	<b>Clinical prevention/Health promotion</b> <b><i>Health promoter</i></b>
1. Influence the impact of policies on health care and health outcomes, including impacts on vulnerable populations, such as homeless people and/or those with disabilities 2. Contribute to alleviating the effects of poverty	1. Identify and refer clients who must be immunised
<b>Population health</b> <b><i>Population health practitioner / Health advocate</i></b>	<b>Health systems and health policy</b> <b><i>Manager and leader</i></b>
1. Negotiate entry into communities and partnerships for health care, including a broad network of community leaders and community-based organisations, like religious organisations 2. Apply strategies to build community capacity in partnerships 3. Advocate for the assessment and management of environmental risks, e.g. air pollution	1. Work effectively with volunteers 2. Understand methods of financing healthcare institutions and services, locally and internationally 3. Financially manage projects, programmes, services and/or departments, e.g. compile budgets 4. Compile requests and/or orders for procurement according to relevant regulations/policies 5. Train community members to become mid-level workers, like rehabilitation facilitators 6. Respond to disasters and assist communities in recovery, e.g. with rehabilitation of those with spinal cord injuries after an earthquake 7. Understand the process of health policy making, e.g. on departmental, district, provincial and national level 8. Develop policies and plans, e.g. advocacy, advisory and consulting processes that support individual and community health efforts and liaise with government departments at different levels 9. Enforce laws and regulations that protect health 10. Compile a basic balance sheet and interpret one

<sup>a</sup> Less than 70% of panellists allocated a 4 or 4+ on the Likert score for these performance competency statements.



**Box 5.1. Definition of community physiotherapy developed in Delphi round 1**

Community physiotherapy is made up of physiotherapy interventions that include comprehensive health care, including rehabilitation, with the overarching aim of the protection, maintenance and promotion of health and wellness of human communities through organised community effort. The primary responsibility of the community physiotherapist is the population and also groups (e.g. a geographical area such as a health district; or a group of clients, e.g. all those with disabilities in a province) and families. Community physiotherapy takes place in the health sector, but also in other settings such as at schools or in industry. A community physiotherapist combines the theory and practice of physiotherapy, public health and community development. She or he deals with the whole spectrum of clinical conditions, including neurological, neuromuscular, respiratory, orthopaedics (hot and cold) from acute to chronic (e.g. back pain) and throughout the lifespan (including advocacy for children and the elderly.) She or he empowers care givers, significant others and clients themselves to be responsible for their own health and the health of those they care for.

In community-based rehabilitation projects physiotherapists contribute to health care – e.g. health promotion, prevention of disability, medical care, rehabilitation and the provision of assistive devices like wheelchairs. In addition they contribute to the empowerment of people with disabilities – e.g. through social mobilisation, and working with self-help groups and disabled people organisations (DPOs).

Education about health is an essential component of community physiotherapy to promote self-responsibility for health by addressing risk factors of lifestyle diseases. For example, the lack of physical activity is a contributing factor in conditions like stroke and cardiovascular disease, cancer and depression. As exercise experts, physiotherapists initiate and give exercise classes in a variety of settings, e.g. at luncheon clubs, to promote a physically active lifestyle. The physiotherapist also models healthy habits and behaviours. She or he is culturally competent to deal with language, cultural and other elements of diversity in communities.

Within community development a community physiotherapist assists defined target communities (e.g. disease-specific, geographical, or of a certain age group) within the cycle of asset-and-needs profiling, planning, monitoring, implementation and evaluation. The physiotherapist acts as one of many resources, and may contribute by providing training so that communities can address their own issues.

In addition, the community physiotherapist is involved in developing policies; e.g. in the field of health and disability, and human rights. Community physiotherapy is practiced within the local health system, either in the public, private or non-governmental sector. Normal management principles apply, like having a job description. Especially important is supervision and/or mentoring. This prerequisite implies that a community physiotherapy programme is performed by physiotherapists with a range of experience, from newly qualified to experienced practitioners.

The community physiotherapist works in close collaboration with other team members. He or she refers to and is supported by other resource centres at district, regional and provincial level. Already diseased patients are taken care of by these sections of the system so that the community physiotherapist focuses on public health and development. For example, the district hospital could provide social services and wheelchairs.

Furthermore, a community physiotherapist is involved in emergency preparedness and disaster management; e.g. when many patients present with injuries after an earthquake.

Both theory and practical elements of community physiotherapy are important components of undergraduate training. All physiotherapy fields should include a community perspective; e.g. the type of exercises that are appropriate in different settings.

**Table 5.7. Properties and dimensions of community physiotherapy**

Property	Dimension
Target age group	Children - Youth - Elderly
Target group in terms of function	Healthy - Impaired - Restricted Activity - Limited Participation
Comprehensive health care	Prevention - Promotion - Cure - Rehabilitation - Palliative care
Service target	Individuals - Aggregates - Communities - Populations
Discipline	Professional Physiotherapy - Public Health - Community Development
Type of service	One-on-one - Populations-based health and wellness
Venue	Homes - Community Structures, e.g. schools - Health Clinics
Role	Clinician - Manager - Agent of change
Team work	In isolation - Transdisciplinary - Multidisciplinary - Interdisciplinary
Team members	Community-based - Mid-level - Community-service - Senior PTs
Emergency service	Basic emergency care - Disaster management

The staff members found the suggested framework and meso-curriculum useful and appropriate and relevant to the Department of Physiotherapy at the University of Pretoria. Verbal feedback was received during a curriculum workshop (personal communication with

the 2012 physiotherapy staff and D Scheepers and H Untiedt, Department of Education Innovation).

## DISCUSSION

This study reports core competencies for undergraduate community and public health physiotherapy. Different stakeholders – clinicians, managers, educators and researchers – participated in this e-Delphi study. Eight competency domains were identified after the first round of a Delphi: clinical practice, professionalism, communication and collaboration, evidence-based practice, clinical prevention/health promotion, population health, aspects of community practice, and health systems and health policy. Performance competencies for each of these competency domains were identified in the second round of a Delphi. The competency domains coincide with certain professional roles and are presented in Figure 5.1 and in Tables 5.5 and 5.6.

The definition of community physiotherapy as modified by panellists includes competencies for community physiotherapy in three domains: clinical physiotherapy, population health and community development. However, answers to open questions revealed that these three domains need to be complemented by the competencies of the other domains.

Similarly, the four domains set forth by the Clinical Prevention and Population Health Curriculum Framework are not adequate for comprehensive community physiotherapy (Carey and Roper 2004; Allan et al. 2005). This finding supports the spirit of the recommendations of the Lancet Commission on Education of Health Professionals for the 21<sup>st</sup> Century, which argues for health professional graduates who are much than clinicians in order to meet the health needs of society (Frenk et al. 2010). The findings are also aligned with empirically determined graduate attributes for healthcare profession students (Williams, Onsman and Brown 2012).



Figure 5.1. The Kaleidoscope Competency Framework

The identified competencies are similar to the physician roles in the CanMEDS framework (Frank 2005; Rourke and Frank 2005; Frank and Danoff 2007). The traditional order of the CanMEDS roles are medical expert, communicator, collaborator, manager, health advocate, scholar and professional (Mickelson and Macneily 2008). In the current study, the physiotherapy panel ranked the role of manager and leader the lowest. The roles of professional and scholar ranked higher than in CanMEDS. Reasons for this may be that physiotherapists in South Africa tend to associate community physiotherapy with the compulsory community year served by newly registered physiotherapists. Therefore, they did not attribute many management activities to community physiotherapy. Also, during the year of compulsory community service physiotherapists tend to complain of a sub-optimal practice environment, including relatively poor management (Mostert-Wentzel et al. 2013b). This situation may be a reason for the higher emphasis on professionalism by the physiotherapy panel.

In the current study's framework panellists referred mainly indirectly to health advocacy. South African physiotherapists tend not to view health advocacy as being as important as other elements of service delivery and social responsibility (Maleka et al. 2008; Mostert-Wentzel et al. 2012). In a Danish CanMEDS study medical participants also ranked health advocacy low (Ringsted et al. 2006). The physiotherapy panel viewed advocacy on an individual level to happen through education of clients, care givers and team members, and on a community level through health promotion projects, which – in the current study – are dealt with in the roles of the health promoter and public health practitioner. At societal level physiotherapists advocate for health by promoting supportive policies, in their role as managers and leaders (Ladhani, Scherpbier and Stevens 2012). In addition, the role of community developer/change agent encompasses the health advocacy role, especially for the poor and those marginalised by disability (Thomas 2005).

“Agent”, “advocate” and “promoter” are synonyms. However, subtle differences are seen when the origins of the words are investigated. “Advocate” derives from a verb meaning “to summon” or “to call”. “Agent” originates from “to drive, lead, act or do”. Therefore, an agent “works with” and an advocate “talks on behalf of”. Agent of change fits better with the philosophy of allied healthcare workers. “Promoter”, on the other hand, is “a substance

that in very small amounts is able to increase the activity of a catalyst” (2012). Health promoter was therefore selected for the role of educating clients about health, where how the client reacts to information is more important than the information itself. Agent of change was selected for physiotherapist work with groups, especially people with disabilities, that aims at community development.

As in CanMEDS, a clinician/expert is the central and most important role (Chou et al. 2008). As clinician the graduate physiotherapist is an accountable, competent, confident, first-line physiotherapy clinician, who applies clinical skills to evaluate, diagnose, treat and refer clients of all age groups, with acute or chronic diseases while understanding the course of diseases and the determinants of health.

On graduation, the physiotherapist must be an autonomous professional, who: acts with consideration of the legal and policy environment and the human rights of clients; acts according to ethical principles; complies with the statutory requirements and is an altruistic, balanced, resilient, culturally competent and reflective practitioner taking responsibility for life-long learning. Helpful in this regard would be a professional development portfolio and structured and unstructured reflection and feedback, starting from the first year of study (O'Loughlin et al. 2005; Hodges, Mclachlan and Finn 2009; Sandars 2009). According to panellists, realistic case studies and scenarios, ample opportunity to grapple with ethical and cultural issues, and role models would also be helpful (Monrouxe, Rees and Hu 2011; Tsai et al. 2012).

The third role of the graduate physiotherapist identified by the panel is that of a communicator and collaborator, who functions in culturally sensitive and competent ways with diverse clients and stakeholders in multi-, inter- and trans-professional teams in patient-centred ways, following dynamic approaches – including the use of information technology – in non-hierarchical relationships (Smith 2005; Betancourt 2006; Lee, Sullivan and Lansbury 2006; Bentley et al. 2008; Umar Méndez et al. 2008; Parry and Brown 2009; Rosenberg 2010). Teaching humanities to physiotherapy students is increasingly important to fulfil these roles (Mc Ateer and Murray 2003; Bleakley, Marshall and Brömer 2006; Smith et al. 2006).

The scholarly role implies a practitioner who can find, gather, appraise and use scientific information, and who works inquiry-led and work-evidence based towards innovative solutions to ensure safe, effective, efficient, and quality community physiotherapy practice (Liabsuetrakul et al. 2009). Panellists emphasised these skills in the workplace, especially because of barriers to evidence-based practice, such as insufficient facilities isolation from colleagues, and research that not reflect clinical practice (Metcalf et al. 2001; Grimmer et al. 2004; Whitcomb 2005; Riegelman and Garr 2008; Munten et al. 2010; Heiwe et al. 2011; Dijkers, Murphy and Krellman 2012; Munten 2012).

As health promoters, the graduate physiotherapists were identified as professionals who apply screening, counselling, health education and preventative interventions to identify and modify risk factors and promote healthy living in clients, groups and populations. Health promotion is undeniably a central component of community physiotherapy (Dean 2009a; 2009b; Mostert-Wentzel et al. 2013a; 2013b).

Another identified role is that of a population health practitioner, who contributes to the health of populations through empowerment and population-based physiotherapy interventions, taking the health priorities of the country and local and global health agendas into account. These have been neglected skills. An important prerequisite of population health practice emphasised in this study is that practice must happen in teams (Lobstein, Baur and Uauy 2004; Axelsson and Axelsson 2006; Seemungal and Wedzicha 2006; Hultberg, Lannroth and Allebeck 2007; Krishnan et al. 2008; Roe 2009).

An agent of change and community developer who contributes to community development through partnerships and physiotherapy programmes, including promoting the re-integration of people with disability into society, is a role given high priority by panellists, again stressing team work. Some voiced doubt whether this is in fact a physiotherapy role. These activities often happen as part of community-based rehabilitation programmes (Hartley et al. 2009; Johansson et al. 2009b; Kendall et al. 2009). The ICF, emphasising re-integration of people with disability into society, was suggested to be an apt theoretical framework for the role of community developer/change agent, supported by the literature (Allan et al. 2005; Allan et al. 2006; Badley 2008; Cieza and Stucki 2008; Lollar and Crews

2003). Community development is increasingly seen as essential in health promotion (Robinson and Elliott 2000; Bhattacharyya 2004; Adams, Witten and Conway 2009).

Lastly, panellists expect the physiotherapy graduate to act as a leader and manager, who understands health systems and manages clinical prevention- and public-health physiotherapy services and interventions (Stephenson et al. 2002; Nicklin et al. 2004; Tourangeau et al. 2010; Jones et al. 2011).

How are the discussed professional roles, represented in international physiotherapy curriculum frameworks? The Canadian competency took over the CanMEDS roles (Accreditation Council for Canadian Physiotherapy Academic Programs et al. 2009) and therefore differs in the same way as already discussed from the Kaleidoscope Competency Framework. Both the Australian standards and New Zealand competency frameworks focus on the process of physiotherapy clinical interventions (Australian Physiotherapy Council 2006; The Physiotherapy Board of New Zealand 2009). The Australian standards only hint at health education, whereas education is prominent in the New Zealand framework. The Chartered Society of Physiotherapy curriculum framework<sup>4</sup> describes activities that correspond with the professional roles. What sets this study's framework apart is the explicit attention to community aspects of practice.

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#### LIMITATIONS

Due to the mixed nature of the research, both qualitative and quantitative criteria apply. The low response rate in the first round has probably been offset by the fact that those who did take the trouble to respond were interested in and serious about the topic (Goodman 2006). From round 2 onwards the panel was purposively selected from a range of work settings and professional responsibilities to improve the truthfulness of the consensus view. Commitment to participate after the initial invitation could perhaps have been improved if individuals could have been invited as representatives of organisations as suggested by Tapio (2003).

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<sup>4</sup> Only the introduction is available to non-members



A different panel may have reached a different consensus, but noticeably different findings are unlikely and the findings are probably truthful. This conclusion is supported by the clear questions, purposive sampling scheme of heterogeneous panellists and the triangulation of data source and method and the sound theoretical framework used in the development of the round-2 instrument (Thurmond 2001; Loo 2002; Cornick 2006; Efstathiou, Ameen and Coll 2008; Shaw et al. 2010). For credibility, the sequential rounds were a form of member checking (Engels and Powell Kennedy 2007). The audit trail of the coding history that is electronically available enhances the confirmability of the findings (Skulmoski, Hartman and Krahn 2007).

Owing to these measures the content and construct validity of the Delphi instrument was strengthened in the quantitative second round of the Delphi (Hasson and Keeney 2011). The test-retest reliability of the Delphi instruments has, however, not been determined. Nevertheless, as was shown statistically, this quantitative instrument had good internal consistency. As the survey was self-administered inter-observer reliability is not relevant (Hasson and Keeney 2011).

The panel was not asked to justify its scores or qualitative answers, and this oversight limits the interpretation of the findings, although the specific core competencies are truthful. The framework was, indeed, found applicable (previously called “transferable”) during two workshops (Graneheim and Lundman 2004; Engels and Powell Kennedy 2007). Wider generalizability will have to be tested or evaluated.

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#### IMPLICATIONS FOR PRACTICE

Importantly, the framework emphasises roles for the physiotherapist in non-clinical settings, with other words in population health and community-based settings. Both education institutions and service providers need to embrace this expanding role of the physiotherapist.

Like the widely used CanMEDS framework, the overarching professional roles identified in this study offer a meta-cognitive framework to guide teaching and learning. First, the

## CHAPTER 5. Competency framework

framework can be used as an organising model to develop a curriculum for community physiotherapy. The first step would be to identify education and assessment strategies.

Students can practically use the framework in clinical settings, not only community physiotherapy, to plan and implement comprehensive interventions and sensitive yet effective interaction with clients and other stakeholders. Clinical supervisors will likewise find the framework useful when supervising undergraduate students. The framework would assist registered physiotherapists to gauge possible limitations in their own competencies, and to seek further development. The framework can also guide developers of continuous professional development courses.

### CONCLUSION

Core competency domains for community physiotherapy were identified through physiotherapy panellists with a background in clinical work, education and research to be clinical practice, professionalism, communication and collaboration, evidence-based practice, clinical prevention/health promotion, population health, community aspects of practice and health systems and health policy.

In the following chapter, recommendations for teaching and learning, and assessment, strategies to educate undergraduate students for these identified roles, are explored.

## 6. EDUCATIONAL AND ASSESSMENT STRATEGIES

*The self is not something ready-made,  
but something in continuous formation through the choice of action*

John Dewey

### INTRODUCTION

Chapter 5 describes the first round of the Delphi used in this study. In this chapter the second round is dealt with. A competency framework with nine professional roles needed by a physiotherapist for community physiotherapy was developed. This chapter reports on the outcomes of the third round of the Delphi, which identified (1) the appropriate teaching and learning strategies for, and (2) assessment of these nine competencies.

### BACKGROUND

The healthcare and education environments are dynamic. On the one hand, education institutions continually need to ensure that curricula are still aligned with the health needs of society (Frenk et al. 2010; Sales and Schlaff 2010; Oandasan 2011; Basu and Roberts 2012). On the other hand, new innovations in education must be incorporated into new curricula (Roberts 2012). The design of new curricula can be approached in different ways (Morcke and Eika 2009). Traditionally curriculum development or -revision followed the process of first identifying the competencies or programme outcomes that should be in place for graduates to be fit for practice in the current healthcare environment (Wong 2006; Kern, Thomas and Hughes 2009). Second, the aligned learning experiences that would lead to the achievement of these competencies had to be identified, and assessment strategies that were in agreement with the competencies and education strategies developed (Ury, Arnold and Tulskey 2002; Scheele et al. 2008; Ross and Loke 2010).

A curriculum is a complex system with many variables – in its context (international, national and institutional), intricate nuances in content, teaching and learning strategies, assessment options, student characteristics, available educational resources, educators and

## CHAPTER 6. Teaching, learning, and assessment strategies

others (Knight 2010: 374). Taking these variables into consideration some designers start to apply the theory of complex adaptive systems to curriculum development (Mennin 2009; 2010). With this approach – in contrast to more traditional, pre-planned, stepwise approaches – innovations are introduced to the curriculum that cause in-equilibrium through self-organisation of the agents in the system, which may lead to transformation (learning) (Kernick and Mitchell 2010; Knight 2010). Facilitating conditions, such as the opportunity for joint reflection, need to be set in place (Doll and Trueit 2010).

The goal of health sciences education, and therefore of the curriculum, is for students to transfer already acquired knowledge to complex new and unfamiliar problems and situations, which include community and public health settings (Patel, Yoskowitz and Arocha 2009: v). Four learning theories are available that curriculum developers should consider for complex learning, such as is involved in clinical reasoning and system-based interventions. Anderson's adaptive character of thought (ACT-R) theory integrates procedural (how to do something) and declarative (facts) knowledge. Cognitive load theory takes into account the cognitive load, both in terms of content and nature of the material presented to learners, when designing syllabi. Situated learning theory focuses on learning in context (real life if possible) and in collaboration, and in cognitive flexibility theory learners use prior knowledge in new situations to form new models of reality (Patel et al. 2009).

In addition to learning theories, four elements that current curriculum developers in health sciences education and medical care must incorporate are (1) personalised medicine, (2) evidence-based practice, (3) inquiry-based learning, and (4) team-based learning (Patel et al. 2009). A guideline that can be used for curricula development is a competency framework. The CanMEDS Family Physician Competency Framework is one framework that identifies professional roles for fit-for-practice postgraduate medical education (Frank 2005; Frank and Danoff 2007; Sherbino et al. 2011). The framework has been adopted widely: geographically and by different professions (Goecke et al. 2008; Verma et al. 2009; Wangler 2009; Whitehead, Austin and Hodges 2011; Turner et al. 2012). The Kaleidoscope curriculum framework for physiotherapy described in Chapter 5 contains similar roles, identified through a consensus-building process. This framework differs from the CanMEDS framework, first, in that the health advocate role was divided into activities for clinical

## CHAPTER 6. Teaching, learning, and assessment strategies

prevention (health promoter) and population-orientated activities (population practitioner). The role of health advocate was, indeed, found difficult to define. For example students, such as urology registrars, tended to be fairly ignorant about the health advocate role (Macneily 2007; Earnest, Wong and Federico 2010). Second, the additional role of community developer, which focuses on using strategies such as social mobilisation and social action, was an additional role that emerged for physiotherapists and was probably relevant to other allied health professionals as well (Robinson and Elliott 2000; Rothman 2000; Ohmer and Korr 2006; Rothman 2008; Adams, Witten and Conway 2009).

### METHODS

The population included physiotherapists from the different sectors and levels in the South African health and education systems. The setting, population, recruitment and composition of the panel of Delphi round 1 are described in Chapter 5. Everybody who participated in round 1 was invited to round 2.

Panellists had to answer two questions about each of the core competency domains on which the panel had reached consensus in the previous round – clinical practice, professionalism, communication and collaboration, evidence-based practice, clinical prevention/health promotion, population health, aspects of community practice, and health systems and health policy. They were asked to list, first, ideal teaching and learning activities for each competency and, second, assessment strategies. A text box was also provided for comments. (Refer to Appendix D for the survey instrument.)

The instrument was piloted for clarity with academics (n=5) knowledgeable about health sciences education, public health in the undergraduate curriculum, questionnaire development and community physiotherapy. Panellists received a link to the survey in the commercial web-based survey system, SurveyMonkey, in a personal e-mail.

Ethics clearance had been obtained and the first screen in the survey explained the nature and aim of the survey and the panellists' rights (refer to Appendix M). Completion of the survey implied informed consent. Data was textual and was thematically analysed (Tesch 1995).

## RESULTS

Forty-nine panellists from these different ecological sectors participated in this round of the study. Table 6.1 gives the distribution of the panel by different variables, such as qualification and work experience. Eighty per cent of the panel had qualified more than ten years previously. More than half had higher degrees (masters or PhD), took on different professional roles and had experience in a variety of work settings. All the panellists had work experience in hospitals or rehabilitation centres, almost 60% in academia, and 70%+ in community-based settings.

## CHAPTER 6. Teaching, learning, and assessment strategies

**Table 6.1. Characteristics of the panel (n=49)**

<b>Compulsory community service experience</b>	<b>Frequency (%)<sup>a</sup></b>
Busy with compulsory community service	0
Did community service earlier	9 (20)
Qualified before 2003 and did not serve	23 (54)
Not applicable	11 (26)
Non-response	6
<b>Qualification (Degree)</b>	
Bachelor/Certificate	20 (47)
Masters	13 (30)
PhD	10 (23)
Non-response	6
<b>Gender</b>	
Female	31 (72)
Male	12 (28)
Non-response	6
<b>Professional role</b>	
Work hands-on with patients	15 (34)
Manage and/or develop and monitor policy	5 (11)
Teach healthcare professionals at a tertiary institution	17 (39)
Do research	1 (2)
Other (please specify)	6 (14)
Non-response	5
<b>Work setting<sup>b</sup></b>	
University	26 (59)
National or provincial government department	8 (18)
Non-governmental or disabled people organisation (NGO/DPO)	9 (20)
Home for the elderly/Hospice	11 (25)
Clinic/Community health centre/Domiciliary service	31 (70)
School (secondary and special)	7 (16)
Sport centre	3 (7)
Hospital/Rehabilitation centre	44 (100)
Private practice	20 (45)
Non-response	5

<sup>a</sup> Percentage of those who answered the question.

<sup>b</sup> Panellist could select more than one option.

## CHAPTER 6. Teaching, learning, and assessment strategies

Recommendations by the panel are listed by professional role in Table 6.2 and Table 6.3. Crosses in both tables indicate the findings from the panel. More recommendations were made for the more traditional roles, such as the clinician, professional, communicator and collaborator, compared to the emerging roles like population health practitioner, community developer and manager and leader.

**Table 6.2. Key tools for instructing the professional roles**

	Clinician	Professional	Communi- cator	Collabo- rator	Scholar	Health promoter	Population health practitioner	Community developer	Manager and leader
Case-based problems* and workshops	x	x	x	x	x	x	x	x	x
Journal club*					x				
Lecture*	x		x	x		x			
One-on-one teaching*	x					x			
Role-play*			x	x					
Peer-feedback		x							
Reflection	x	x	x	x					
Role-modelling		x							
Service-learning	x	x	x	x	x	x	x	x	x



## CHAPTER 6. Teaching, learning, and assessment strategies

The plus signs in Table 6.3 represent assessment tools recommended by the Royal College of Physicians and Surgeons of Canada, which developed the CanMEDS framework of meta-competencies (Bandiera, Sherbino and Frank 2006). No panellist specifically suggested objective structured clinical examinations (OSCEs), simulated patients (SPs), multiple source feedback (MSF) or log books as assessment strategies.

**Table 6.3. Key tools for assessing the professional roles**

Assessment strategy	Clinician	Communi- cator	Collaborator	Health promoter	Manager	Scholar	Professional	Community developer	Public health practitioner <sup>e</sup>
Written tests <sup>a</sup> , SAQ, MCQ	X +++		++	++	+	X ++	X +		++
Essays	X ++		+	X +++	X +	X +	X +	X	+++
Oral exam	X +++		+	+	.	.	+		.
Direct observation/ITER <sup>b</sup>	X +++	X +++	X +++	X +++	X +++	X +++	X +++		X +++
OSCE <sup>c</sup> /SP <sup>d</sup>	+++	+++	+++	++	.	.	+		+
MSF <sup>e</sup>	++	+++	+++	+++	+++	++	+++		+++
Portfolio	X ++	X ++	X +	X +++	X ++	X +++	X +++	X	X +++
Simulations	+++	+	+++		++	.	++		++
Logbooks	*								
Recordings (audio and video)	*	X	X				X		
Presentations						X	X		
Peer +other evaluation	*					X			

x = recommended by Delphi panel + = suitability according to CanMEDS (Bandiera et al. 2006)\* From literature. MCQ (Multiple Choice Question) and SAQ (Short Answer Question); <sup>b</sup> ITER means In-training Evaluation Report; <sup>c</sup> OSCE means Objective Structured Clinical Examination; <sup>d</sup> SP means Simulated Patient; <sup>e</sup> MSF means Multiple Source Feedback (also referred to as '360 degree evaluation') <sup>e</sup> CanMEDS advocacy role was documented.

## CHAPTER 6. Teaching, learning, and assessment strategies

Tables 6.4 to 6.9 contain specific recommendations from the panel. Teaching and learning strategies are given in the first column of the tables and the assessment strategies in the second. The tables are organised by the professional roles/domains of the Kaleidoscope model. For both the clinician and the professional a combination of introductory lectures and authentic practice-based experiences and assignments was suggested. When using rubrics, these experiential learning activities are also suitable for assessment.

**Table 6.4. Educational standards for the roles of clinician from panel comments for the clinician role**

Teaching and learning strategies	Assessment strategies
<b>Clinician</b>	
<ul style="list-style-type: none"> <li>- Use and apply the ICF lectures on holistic patient care based on participation and independence – including return-to-work case study of a patient with proposed treatment from start to final discharge back to work; exposure to various clinical settings and areas.</li> <li>- First basic information for each field; then clinical reasoning skills; then application on scenarios/cases</li> <li>- Observing a dedicated, passionate role model.</li> </ul>	<ul style="list-style-type: none"> <li>- Assess documentation including ICF and treatment plans, direct observation.</li> </ul>

**Table 6.5. Educational standards for the roles of clinician from panel comments for the professional role**


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**Professional**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>- Preparatory doc[umentation][s] e.g. human rights then group study of scenario/video/field visit/case study then group reflection.</li> <li>- Theoretical lectures to give an in-depth understanding of what professionalism is, what legal and ethical frameworks are applicable to physiotherapy and what the therapist's/patient's rights and responsibilities are.</li> <li>- Case studies/scenarios from every-day public health situations need to be debated thoroughly and guidelines given by competent lecturers.</li> <li>- Reflection – possibly in a group setting; particularly after clinical sessions or at the end of a clinical placement.</li> <li>- Real tasks that should be presented as a portfolio and backed by a reflective diary and literature. It is also important to have variety and build up from theory that is staggered within the curriculum.</li> <li>- Field visit (3 weeks/longer, structured well) during which a reflective learning diary is kept.</li> </ul> | <ul style="list-style-type: none"> <li>- Direct observation/video audio recording to assess behaviour – too easy to say the "right" things vs doing it – difficult to assess direct observation so possibly video is best as a permanent record.</li> <li>- Rubrics for the outcomes of the tasks and essays, presentations for the case studies and projects, rubrics for the reflection tasks, direct observation in the clinical field.</li> </ul> |
|--|---|
-

## CHAPTER 6. Teaching, learning, and assessment strategies

Panellists suggested that the communicator and collaborator role can best be learnt in interaction with others, including supervisors, peers and students from other health sciences departments. Cultural sensitivity was also emphasised. Video- and audio-recordings are suitable for assessment of these roles. A project such as an awareness campaign offers various opportunities to practise and assess different types of verbal and written skills.

**Table 6.6. Educational standards for the role of communicator and collaborator from panel comments**

Teaching and learning strategies	Assessment strategies
<b>Communicator and collaborator</b>	
<ul style="list-style-type: none"> <li>- One-on-one meetings with field supervisor at commencement, during and upon completion of the block – make these interactions very open-ended and exploratory? You could supplement this with their reflective diary?</li> <li>- Basics of learning a new language and also its importance [during] field visits.</li> <li>- For cultural aspects: lectures on what define our own culture (perhaps an assignment on this), then open cross-cultural discussions amongst classmates based on aspects of the lecture/assignment. Health literacy also links closely with socioeconomic barriers to accessing care and social structure (this can be examined in a lecture) as well as traditional views of health and disease. And then they will need practical exposure and reflective diaries.</li> <li>- As for working within MDT [multidisciplinary teams] – students should be socialised as early as possible with the other professions; as first years: academically and socially. Registrars and consultants need to walk the walk too – of appreciating each professional for the value they add to the management of the patient. Students could be grouped into MDT teams and given patients to assess and manage, instead of the silo that is currently the norm.</li> <li>- Lecture by a credible person not necessarily a physio[therapist].</li> </ul>	<ul style="list-style-type: none"> <li>- Video/Audio recording of therapist in real-life clinical setting without their knowledge, but with their prior consent.</li> <li>- 3<sup>rd</sup> year group project in which an awareness campaign is planned, organised and presented to a specific target group, accompanied by a comprehensive written report which includes e.g. correspondence to different stakeholders, minutes of meetings, project proposal, planning, attendance register of target group, feedback, reflection etc.</li> <li>- Video with the student giving comment on themselves.</li> </ul>

## CHAPTER 6. Teaching, learning, and assessment strategies

According to the panellists the roles of scholar and health promoter are also to be taught and learnt by applying theory to authentic situations. Weaving the use of evidence to support arguments in as many as possible activities is argued for. (Refer to Table 6.7 and Table 6.8 for quotes.)

**Table 6.7. Educational standards for the roles of scholar and health promoter from panel comments**

Teaching and learning strategies	Assessment strategies
<b>Scholar</b>	
<ul style="list-style-type: none"> <li>- Exposure to a community with public health issues, needs analysis, project design for improvement based on EBP identified by students, journal club for each block – where the students report their findings to their peers and supervisor.</li> <li>- Partner with rural clinicians to assist them with their protocol files!</li> </ul>	<ul style="list-style-type: none"> <li>- This can be done through any of the assessment methods as long as the assessment of literature is a component of it and should be deliberately included in any assessment method for any task. As such it should be a mainstreamed component to inform whatever learning outcome is being tested.</li> </ul>
<b>Health promoter</b>	
<ul style="list-style-type: none"> <li>- Using the ICF, interprofessional collaboration in tertiary, secondary and district level, exposure in IPT [interprofessional teams] to primary healthcare settings and poverty, effects of disease etc, reflection, assignments aimed at primary healthcare prevention and promotion and application of this knowledge to every patient's documentation form they have to complete regardless of the area of work.</li> <li>- Following an introduction to the theory – an integrated assignment that is multifaceted.</li> <li>- Field assignment to investigate current systems after which a written assignment can be done whereby the student designs a specific programme according to the available resources (including staff) and system constraints.</li> </ul>	<ul style="list-style-type: none"> <li>- Written assignment on the effectiveness of health promotion, and also a creative design of a health promotion idea in a setting they are familiar with – perhaps with a practical element.</li> </ul>

## CHAPTER 6. Teaching, learning, and assessment strategies

Both teaching and learning and assessment strategies for educating on the roles of public health practitioner and community developer need to reflect the complexity of these roles. Rather than testing knowledge, strategies such as delayed action tests could be tried out. Experiencing the living experiences of communities and children with disabilities, combined with reflective activities, would suit these two roles well.

**Table 6.8. Educational standards for the role of public health practitioner and community developer from panel comments**

Teaching and learning strategies	Assessment strategies
<b>Public health practitioner</b>	
<ul style="list-style-type: none"> <li>- After being in the field and doing practical work, then assign them to identify the strengths and needs, assess health problems... then set up a plan to improve and manage these risks and to solve the health problems.</li> <li>- Transect walks and community interviews and home visits. A day in the life of... get them to do a bit of ploughing, water carrying, C[erebral] P[alsy] child minding, etc. – and give them things to assess such as ergonomic stressors to assess?</li> </ul>	<ul style="list-style-type: none"> <li>- To do an actual review of a certain population and develop/apply a program to address the problems.</li> </ul>
<b>Community developer</b>	
<ul style="list-style-type: none"> <li>- Field exposure and reflection on the reality of the current situation coupled with a reflection and brainstorming plan of how it could improve, ICF lecture – implement it within all blocks and Interprofessional activities.</li> <li>- A rural practical block where they can begin to understand the complexity of the issues. A compulsory stay with a local family in a rural poor setting for at least a week.</li> </ul>	<ul style="list-style-type: none"> <li>- Direct observation and written self-reflection. I really think with the amount of application a combination of assessment methods would have to be applied. Aspects such as understanding the theory can be assessment via an assignment but seeing how the student applies this knowledge should be via direct observation and their attitude via self-reflection.</li> <li>- Rubrics set up to mark the aims of the specific activities delayed action question papers, i.e. case studies.</li> </ul>

## CHAPTER 6. Teaching, learning, and assessment strategies

Practical ideas were given for education of the role of manager and leader. Ideas vary from managing resources, such as assistive devices and preparing them, to managing projects and services. Multidisciplinary team work with both midlevel workers and rehabilitation team members was emphasised. Again teaching and learning and assessment are best well integrated. (Refer to Table 6.9.)

**Table 6.9. Educational standards for the role of manager and leader from panel comments**

Teaching and learning strategies	Assessment
<b>Manager and leader</b>	
<ul style="list-style-type: none"> <li>- Working in the community setting, learning how stock needs to be controlled, waiting lists kept short, how to refer, how to use assistive devices and implements and how to fix them yourself.</li> <li>- It might be a good idea to include a formal Project Management module in the syllabus in order to teach the skills needed to manage successful projects in a healthcare setting.</li> </ul>	<ul style="list-style-type: none"> <li>- Exposure to volunteering for first hand exposure, coupled with a reflection. Development of maintenance of a project in the community in which they live that spans over three years of their education – conception, implementation and reflection.</li> <li>- Field visit, where the students have to do practical work in these settings, where they will learn how to make home programs, work with other therapists in multidisciplinary team. Let them work in these different work settings, rehab[ilitation] centres, clinics, hospitals, home visits and community.</li> <li>- Maybe they could manage a small service at some stage in their practical - would have to be for a decent amount of time though, or feedback from the previous year's com serves [compulsory community service physiotherapists]- makes it more applicable and memorable if they know they will be there too.</li> <li>- Public health and epidemiology lectures – but keep relating what you teach to how this may influence rehabilitation practices (don't just plonk them into a dry epi[demiology] lecture). A lot of the above has to do with managing personalities. The students need to work within diverse, MDT groups right from the start (other departments need to come on board) in order to develop a professional identity and understand context (and consequence of dropping the ball).</li> <li>- Field visits and written assignments could be used to practise programme design/resource management. Students need to have it emphasised from the start that being a professional does not entitle you to a higher rank in the team – transport and cleaners are just as important and need to be treated with just as much respect if you want to achieve anything.</li> <li>- Perhaps getting the assistants to orientate the first years (introduce them to their [assistants'] patients and showing them the ropes may help build relationships early?</li> </ul>

## DISCUSSION

The Kaleidoscope competency framework as described in the previous chapter emphasises professional roles, such as the population health practitioner, community developer and manager/leader. These competencies are the broad outcome of the undergraduate community physiotherapy curriculum. The process of developing competencies roles are intimately interwoven with appropriate teaching, learning and assessment strategies (Downing and Yudkowsky 2009). The aim of chapter 6 is therefore to explore the views of a range of physiotherapy stakeholders in the curriculum to bridge the gap between the theoretical outcomes of the curriculum (competencies) and how to reach them (Gibbs, Durning and van der Vleuten 2011; Turner et al. 2012). The panel which provided input on the teaching and learning and assessment strategies is discussed first. Second, the findings about teaching and learning, and third, findings on assessment strategies are discussed. In the fourth place implications of complex theory for the implementation of the suggested recommendations is provided.

## THE PANEL

The panel which was consulted consisted of physiotherapy managers, clinicians and academics. They were relatively experienced and well qualified, when considering the number of years since graduation and higher degrees obtained. The panel also brought a diversity of insights from different professional responsibilities (academic, managerial and clinical) and work settings.

## TEACHING AND LEARNING STRATEGIES

Case-based problems and interactive workshops, as a teaching-learning strategy, were found applicable by panellists for the teaching and learning of all professional roles, including that of health promoter in preventative health care. These strategies have been applied widely by other educators (Cibula et al. 2003; Epling et al. 2003; Morrow, Epling and Novick 2003; Novick 2003; Novick et al. 2003; Buckner et al. 2010; Novick, Sutphen and Wabrek [n.d]). 'The goal of CBL [case-based learning] is to prepare students for clinical practice, through the use of authentic clinical cases. It links theory to practice, through the



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application of knowledge to the cases, using inquiry-based learning (Entwistle 2009) methods' (Thistlethwaite et al. 2012). Advantages of case-based teaching and learning are that both the student and the teacher are truly engaged, controversies can be brought to the fore and learning is associated with real life (Pinar 2005; Thistlethwaite et al. 2012: 51). Principles for the development of a good case include: be authentic (based on real patient stories), involve a common scenario, tell a story, align with defined learning outcomes, stimulate interest, create empathy with the characters, include quotations in the patient's voice and promote decision making (Herreid 1997). Different formats using cases in teaching are useful: online, in class (full or in groups), prepared before class or discussed after a class (Nathoo, Goldhoff and Quattrochi 2005; Dijken et al. 2008; Bowe, Voss and Thomas Aretz 2009). Case-based or team-based learning are viable alternatives for problem-based learning, especially in cost-constrained environments (Shanley 2007; Parmelee et al. 2012). Experiences with SP cases can be expanded through discussion in a community of practice (Hayward, Blackmer and Markowski 2006).

Academic service learning was suggested as another strategy where teaching and learning about all nine professional roles can be integrated. Interprofessional projects to address real community needs were suggested as particularly suitable. Experiences in different settings include participation in projects and services, as part of a multidisciplinary team, incorporating one-on-one teaching (Levin and Herbert 2001; Hayward et al. 2005; Baglin and Rugg 2010). The term 'service-learning' has been used to characterise a wide array of experiential education endeavours, from volunteer and community service projects to field studies and internship programmes (Eyler and Giles 1999; Furco 2003; O'Neil, Rubertone and Villanueva 2007). Reciprocal partnerships between communities and educational institutions are fundamental to the approach (Cashman and Seifer 2008). Through service learning, students develop professionalism through a better sense of social justice (Redman and Clark 2002), as service learning placements tend to foster values like altruism and civic or social responsibility (Hunt and Swiggum 2007; Dharamsi et al. 2011; Furze et al. 2011). Service learning can also enhance cultural competency, especially if it comprises immersion in another culture (Beach et al. 2005).

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A critical element of service learning is reflection: before, during and after service; alone, with classmates and with community partners (Schön 1983; 1987; Donaghy and Morss 2000; 2007; Eyler 2002; Karnieli-Miller et al. 2011). Panellists also stressed the importance of reflection. Definitions of reflection ‘emphasize purposeful critical analysis of knowledge and experience, in order to achieve deeper meaning and understanding’ (Mann, Gordon and Macleod 2009: 579). Effective reflection activities link experience to learning and clinical reasoning, are guided, occur regularly, allow feedback and assessment and foster the exploration and clarification of values (Hatcher and Bringle 1997). Themes addressed during reflection by physiotherapy students during clinical practice are professional behaviour, lifelong learning, clinical reasoning, group learning, self-development, improved confidence, the importance of values and beliefs, communication, scope of practice, team work, relationships, an appreciation of the different roles in clinical practice and ethical issues (Williams et al. 2002; Williams and Wessel 2004; Roche and Coote 2008). Applying ethics in public health is exceptionally challenging (Weed 2004). To gain value from reflection the skill must be taught to students (Jim and Xu 2002; Moon 2004; Ward and Gracey 2006; Delany and Watkin 2009).

Collaborative reflection can take place in communities of practice, as the very act of listening and talking to others triggers reflection (Fereday and Muir-Cochrane 2006). For example, reflection with a clinical supervisor and/or peers can lead to transformative clinical practice (Lähteenmäki 2005; Morris and Stew 2007). Technology offers exciting opportunities for such collaborative reflection (Ladyshevsky and Gardner 2008; Sandars 2009; Tan, Ladyshevsky and Gardner 2010; Rowe 2012).

Teaching of evidence-based practice – promoting the scholar role – is another theme in health sciences education (Sanchez-Mendiola 2004; Whitcomb 2005; Prevent Child Abuse America 2006; Leo et al. 2012; Sanchez-Mendiola et al. 2012). Panellists recommended journal clubs to promote scholarly activity. Journal clubs are effective teaching strategies for the scholar role, as are using lectures, seminars and case studies, and integrating evidence-based practice into clinical teaching and during community placements (Hatala et al. 2006; Nabulsi et al. 2007; Feldstein et al. 2010; Khader, Batayha and Al-Omari 2011; West, Jaeger and McDonald 2011; Cheng et al. 2012). Introductory courses in evidence-based practice

## CHAPTER 6. Teaching, learning, and assessment strategies

should, however, not include the appraisal of all types of studies, but rather be limited to therapy and systematic reviews (Yousefi-Nooraie et al. 2007; Liabsuetrakul et al. 2009; de Palma 2011).

Panellists emphasised that evidence for community-based and public health physiotherapy – although only in its early development (Shediac-Rizkallah and Bone 1998; Mowat 2007; Brownson et al. 2008) – needs to be incorporated into the curriculum. This view is widely supported (Rychetnik et al. 2004; Franks et al. 2005; 2006; Baker et al. 2009; Brownson, Fielding and Maylahn 2009; Barnidge et al. 2013; Lewis, Motton and Baker [n.d]). Evidence-based public health (EBPH) is complex, uncertain and variable compared to individual clinical-level interventions (Dobrow, Goel and Upshur 2004). Baker et al. (2009: 342-3) defines EBPH as:

... the development, implementation, and evaluation of effective programs and policies in public health through application of principles of scientific reasoning (Brownson, Gurney and Land 1999; Brownson et al. 2003; Kohatsu, Robinson and Torner 2004) ... and is seen as a decision-making process used to determine the best intervention strategy to use to address the problem at hand for a particular population of interest and the local context.

Public health principles need to be integrated into the curriculum not only when dealing with communities and groups but also when treating individual clients. These principles are: attending to the distribution and causes of diseases, and how these can be prevented, as well as improving healthcare systems for evidence-based care, taking the personal and societal effects on and responses to disease into account (Trevena et al. 2005). Student-led tutorial sessions, for example, can integrate public health into the clinical reasoning about clients (Trevena and Clarke 2002). Finkelstein et al. (2008) emphasised the use of different education strategies used subsequent to each other e.g. engaging students in a lecture involving an overview plus controversy, followed by a conference where students learn through worked solutions, followed by a tutorial where students practise using supervised problem-sets and finally assessment and feedback on project work for the examination.

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Students can participate in public health projects during service learning placements; e.g. multidisciplinary projects, such as presenting a health fair at a primary school or presenting health education talks (Begley et al. 2009).

Panellists suggested role-play to teach communication and collaboration skills. Communication is especially important in contexts where client and therapist may speak different languages (Couper 2002; Cioffi 2005). Role-play has been reported as being successful in this regard and as promoting clinical reasoning, the transition into clinical practice and cultural competence (Windish et al. 2005; Joyner and Young 2006; Boutin-Foster, Foster and Konopasek 2008; Bell, Wideroff and Gaufberg 2010). Role-play – both with SPs/interpreters and with peers – is effective in teaching motivational interviewing, an essential skill in health promotion (Lane and Rollnick 2007; Lane, Hood and Rollnick 2008). Joyner and Young (2006) give guidelines for role-plays, such as developing challenging cases and keeping observers occupied.

To enhance professionalism, panellists suggested role-modelling and peer-feedback in addition to the strategies already discussed. The classical conceptualisation of professionalism is three-pronged: (1) a vocation with a body of knowledge and skills that is (2) put into service for the good of others and the welfare of society with the welfare of patients over the practitioner's own, and (3) self-regulations through a code of ethics. A profession is further characterised by professional education, a journal and an association (Fricker et al. 2011). Professional principles are the primacy of a patient's welfare and autonomy, and social justice (Sox 2002). Recently humanitarian traits and values, such as excellence, integrity and respect, have been emphasised, with a focus on behaviour rather than on personal traits (Mcnair 2005; Scarpaci 2007). Current views of professionalism include judgement in the face of uncertainty, leadership, teamwork, teaching skills, appraisal of information, and management of one's own career and social network profile (Monrouxe, Rees and Hu 2011; Osman, Wardle and Caesar 2012). In other words, professionalism involves dealing with work, others and the self (van Mook et al. 2009a; West 2012). Professionalism is, however, difficult to make explicit in the curriculum.

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Lectures, a strategy for professionalism according to the panel, must be complemented by other teaching and learning methods (Baernstein et al. 2009). Negative ways of teaching through punishing unprofessional behaviour must be replaced by rewarding high standards of behaviour. The personal qualities, values, attitudes and behaviour fundamental to physiotherapy need to be instilled and nurtured. Other suggestions are using sessions that link local literature, arts, and history to medical humanism (Klemenc-Ketis and Kersnik 2011; Tsai et al. 2012). Continuous professional development is important and is to be fostered through self-directed learning and development, which encompass reflective activities (Registered Nurses' Association of Ontario 2007; Robinson, Tanchuk and Sullivan 2012). Indeed, situated learning is not enough; it needs to be complemented by learning in the workplace through observation of positive and negative role models, reflection and reinforcement (Park et al. 2010; Grace and Trede 2011; Byszewski et al. 2012). In addition to peer-feedback, 360 degree feedback (Multiple Source Feedback – MSF) is suggested, with input from different sources, which include peers and patients, combined with constructive longitudinal feedback (Iramaneerat 2009; van Mook et al. 2009c; O'Sullivan et al. 2012).

Cultural competence is another element of professionalism. Cultural competence was specifically mentioned by panellists as an element of professionalism that needs to be nurtured. Cultural competence and efficiency are the ability to work in cross-cultural situations (Mallow and Cameron-Kelly 2006; Bialocerkowski, Wells and Grimmer-Somers 2011) and 'the ability of systems to provide care to patients with diverse values, beliefs and behaviors, including tailoring delivery to meet patients' social, cultural, and linguistic needs' (Betancourt, Green and Carrillo 2002). Self-awareness and assessment are a good starting point towards cultural competence (Stewart 2002; Georgetown University Center for Child and Human Development and National Center for Cultural Competence 2007). Students also need to 'explore their own values, beliefs and ideas, and examine their therapeutic relationships with clients' to improve cultural awareness, sensitivity, knowledge, competence and safety (Papadopoulos and Lees 2002; O'Shaughnessy and Tilki 2007: 69; Klopp and Nakanishi 2012). Multiple approaches can be used for students to explore culture through films, role-playing, case analysis, vignette critique, written narratives, clinical incident interviews, accounts of memorable consultations, reflective diaries and assessment

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of agencies during service learning (Svenberg, Wahlqvist and Mattsson 2007; Boutin-Foster et al. 2008; Cross et al. 2008; Nochajski and Matteliano 2008). Staying in a community overnight can be very useful (Chambers 1998). In fact, one panellist suggested that students spend a week with a poor family. These different strategies should be informed by different cultural models (Kleinman, Eisenberg and Good 1978; Papadopoulos, Tilki and Taylor 1998; Campinha-Bacote 2002; Purnell 2002; Bren 2005; Lattanzi and Purnell 2006; Engebretson, Mahoney and Carlson 2008; Romanello and Holtgreffe 2009).

The educational strategies recommended in this chapter are appropriate for teaching millennials, who are:

very comfortable with role playing and group activities; need to be very active in their learning; may need to be told upfront how and why the information is necessary and how it will be used; may need practice first before presented with theory; want immediate and positive feedback every step of the way; want to know what they are doing right; may not take criticism well; used to being graded; like graphics, video clips; want to feel that they are respected for what they can offer, not treated like children; they don't want to be parented; may need to be taught how to manage time – how to break up large tasks into smaller pieces (Gleeson 2007: 25).

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### ASSESSMENT STRATEGIES

The assessment strategies suggested by the panellists align well with the teaching-learning strategies. For example, rubrics can be developed to assess analyses of cases, simulations, journal clubs, role-play and peer-feedback. Some of the suggested assessment tools are forms of reflection: essays and presentations. On the other hand suggested assessment tools may be effective learning tools. The log book and OSCE, for example, are effective in improving clinical skills (Achuthan, Grover and Macfie 2006; Schoonheim-Klein et al. 2006; Saber 2009; Yousefy, Mosavi and Shayan 2012). Assessment is therefore no longer only *of* learning, but also *for* learning (Clouder and Toms 2008; Schuwirth and van Der Vleuten 2011). Clearly formulated goals of assessment are therefore important (Webb 1997).

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Table 6.10 illustrates the relationship between the level on Miller's pyramid, examples of certain attributes, and corresponding assessment methods.

**Table 6.10. Relationship between level of competence and assessment methods**

<b>Levels of competence</b>	<b>Examples of professional attributes</b>	<b>Examples of assessment methods</b>
Does	Advocates for patients in complex healthcare systems	MSF, medical record review, healthcare processes/ outcomes
Shows	Demonstrate cultural sensitivity in interviewing	Observed real or standardised patient encounter
Knows how	Describes a process for addressing a specific moral conflict	Reflective narrative, portfolio entry, case-based discussion
Knows	Knows/understands core principles of professionalism	MCQ, SAQ, essay exam, case-based discussions

Source: Adapted from Hawkins et al. (2009), First column: Miller (1990)

Although a plethora of assessment tools can be used, over-assessment should be avoided (Brodie and Irving 2006). The Institute for International Medical Education, for example, identified three assessment tools as sufficient for assessing minimum physician competencies similar to those assessed in the current study: The three assessment tools for this project are: (1) a multiple-choice written examination (MCQ), (2) an OSCE using patient and bench simulations with post-interaction exercises, and (3) observer (faculty, peer, nurse, or patient) ratings of performance and logbook of students' learning experiences (Stern, Wojtczak and Schwarz 2003). Although a limited number of tools may be applicable for a summative examination, as the one just described, multiple methods applied by multiple assessors in multiple contexts are essential for formative assessment, and must be combined with reflection and feedback (Bandiera et al. 2006).

Assessment tools for the different competencies exist; for example, the Berlin, Fresno tools and others for evidence-based practice (Fritsche et al. 2002; Ilic 2009; Tilson et al. 2011); the

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P-Mex for professionalism (Cruess et al. 2006); the Nijmegen Professionalism Scale (Tromp et al. 2010); Patient-Reported Physician Cultural Competence (PRPCC) score (Thom et al. 2006); the Jefferson Scale of Physician Empathy: Health provider-student version (Wimmers and Stuber 2010; Fields et al. 2011; Hong et al. 2012); the BECCI for motivation interviewing (Lane et al. 2005); the Mini-Clinical Evaluation Exercise (mini-CEX), Clinical Encounter Cards (CEC), Clinical Work Sampling (CWS), Blinded Patient Encounters (BPE), Direct Observation of Procedural Skills (DOPS), Case-based Discussion (CbD) and Multi Source Feedback (MSF) for clinical competency (Baig, Violato and Crutcher 2009), as well as a tool for community-based education (Mpofu and Imalingat 2006). In clinical cases the number of preventive issues asked about during the patient interview can be used for assessment (Novick et al. 2011).

Clinical work-based assessment methods would also apply to service learning settings where instead of clinical cases, projects and group interventions may be assessed (Norcini 2005; Khan and Coomarasamy 2006; Norcini and Burch 2007; Archer et al. 2008). Work-based methods are ideal for integrating the different competencies, as they are truly intertwined (Bartee et al. 2003; Kalb et al. 2006; Ouzts, Brown and Diaz Swearingen 2006; Castro et al. 2010).

Assessing professionalism has grown in leaps and bounds (van Mook et al. 2009b; Wilkinson, Wade and Knock 2009; Aguilar, Stupans and Scutter 2011), with MCQs found not to be appropriate (Tiffin, Finn and Mclachlan 2011).

When using portfolios for assessment, as recommended by the panel, it is important to differentiate clearly between the learning and the assessment components (van Tartwijk et al. 2007; van Tartwijk and Driessen 2009). Documentation needs to be accompanied by reflective writing (Kuisma 2007; Miller and Tuekam 2011), and intermittent joint reflection with a mentor should be compulsory (Thomé, Hovenberg and Edgren 2006; Mccready 2007). A 30-minute interview focusing on a sample of elements from the portfolio is effective for assessment in a resource-poor environment (Burch and Seggie 2008).



## THE CURRICULUM AS A COMPLEX ADAPTIVE SYSTEM

The chapter provides a material handle on the curriculum along complex theory. According to this theory, the curriculum 'should be seen as a planned set of worthwhile activities related to important material within the expectations of a subject community' (Stenhouse 1975). The suggested teaching and learning strategies, such as case analysis, community projects and role-play, provide material for worthwhile activities. The nine professional roles represent expectations of the subject community.

The teaching and learning strategies also have the potential for other conditions to stimulate transformative learning, such as creative 'play', interaction, shared decision-making, collaboration, and building relationships in different variations of similar situations. Questions, incomplete understanding, dialogues, unresolved issues inherent in parts of cases and service-learning experiences all may act as stimuli for self-organisation and learning. As forms of interpretive inquiry, with its complexity, they exemplify an open-system approach. In contrast, direct instruction, with its simplicity, exemplifies a closed system. Closed systems transfer and transmit, while open systems transform (Doll 2008: 197).

In terms of assessment regular feedback and formative assessment provide short feedback loops. Feedback gives the opportunity for assessment to be a conversation.

The underlying process by which complex adaptive systems adapt to changing circumstances, and achieve integration, learning and understanding, is called self-organisation (Mennin 2010a). Pre-requisites for self-organisation are: (1) open boundaries, far from equilibrium; (2) large number of interacting elements, multiple short feedback loops; (3) fuzzy boundaries; and (4) agents change through multiple non-linear local interactions (Mennin 2009). How can a community-based placement facilitate self-organisation of learning? First, learning is facilitated through an amount of freedom; e.g. in terms of how students structure their schedule, by introducing new challenges and role-players. Second, learning takes place through interaction with other students, also from other disciplines, a variety of patients, caregivers, and non-governmental organisations with interaction and feedback. Third, ill-defined boundaries, such as ground rules for small-group

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discussions, ethical and professional codes of conduct, learning outcomes in terms of professional competencies/roles are conducive for learning. Fourth, through feedback and different forms of formative feedback, self, peer, group, lecturer and community, stakeholders stimulate learning.

A complex system is also integrated. Integration refers to ‘the dynamic interconnectedness that emerges from recursive interactions at multiple levels’ (Mennin 2009: 24). (See also Cook et al. 2008.) If web-based teaching and learning, such as online discussion groups and collaborative blogs and wikis, is available it can offer a favourable alternative to face-to-face teaching and learning to make the course interesting and address diverse learner preferences of the current generation (Potomková, Mihál and Schwarz 2012).

The curriculum needs to be rich, recursive, relational and rigorous (Doll and Trueit 2010). Richness comes from the depth of the curriculum and interconnectedness (Doll 2008). The effects of physical activity may be dealt with in patients of different ages, socio-economic status, health conditions and settings (e.g. home versus a health centre); first with paper cases, then simulations and finally ‘real’ patients.

Another example is where students are introduced to the concept of risk factors of disease in the Public Health module in their first year of study. However, the physiology of risk factors such as hypertension is dealt with in the subject Physiology. In second year, students learn strategies to educate groups of clients about risk factors. In third year, they learn motivational interviewing to facilitate change to healthy habits in individual clients with risk factors and, in the fourth year of study, they have to develop an evidence-based community project to address risk factors.

In a complex adaptive system the curriculum is recursive; for example, through formative assessment opportunities and a reflective portfolio on the community placement (Doll and Trueit 2010). One experience leads in an orderly way to learning that can be applied in a new experience (rather than repetition of the same learning experience). Relations are also important: between teacher and student, peers, other disciplines, cultures and environments. Communities of practice are therefore important.

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Lastly, rigour refers to ‘purposely looking for different alternatives, relations, connections...’, asking questions, seeking solutions (Doll 1993). Table 6.11 gives examples of teaching and learning activities from a complexity perspective.

**Table 6.11 Selected teaching and learning activities from a complexity perspective**

Teaching and learning activity	Complexity perspective
Frame learning; set the scenario, providing boundaries that are permeable	Reduces degrees of freedom and number of contingencies for learners
Help focus discussions	
Use context as that which weaves us together	Promotes self-organisation
Indicate and point out differences	
Share your observations as co-evolution	Promotes self-organisation
Pose questions	Functions as a control parameter
Reflect on your own uncertainties and frontiers	
Support reflection and feedback	Recognise collective variables that emerge from self-organising (i.e. learning)
Promote informed creativity with reflection and feedback	Identify liberating constraints
Provide iterative variability (many variations of similar experiences) consistent with the development of expertise	

Source: Mennin (2010b)

Learning in a complex system does not take place in students’ heads, but in their interactions and relationships. The progression has been from teacher- to student-centred learning and currently the focus has moved to relationship-centred learning (Mennin 2010b). ‘*Poiesis*, etymological root of the word *poetic*, is related to making meaning through interactions with others, with the environment/cosmos, and reflexively to develop a sense of being-in-relation. Knowledge, in this schema, is fluid, evolving, situated, communal, and is based on patterns.’ (Trueit 2005: ix). The top-three skills identified for the 21<sup>st</sup> century in the

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United States of America are aptly: cognitive, intrapersonal and interpersonal (Pellegrino and Hilton 2012; Voogt and Roblin 2012). This concurs with Epstein and Hundert's (2002) perspective that "competence depends on habits of mind, including attentiveness, critical curiosity, self-awareness, and presence; attentiveness, critical curiosity, self-awareness, and presence; that it includes the cultivation of emotions, values, and reflection in daily practice; and that it is developmental, impermanent, and context dependent" (Browning, Meyer, Truog and Solomon 2007).

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### LIMITATIONS OF THE RESEARCH

The chapter was not intended to deal comprehensively with teaching, learning and assessment strategies. However, it does give ideas to prepare students for the multiple roles expected of them by the time that they graduate. For strengths and weaknesses and information on validity and reliability of different assessment methods see Bandiera et al. (2006) and Epstein (2007). Blue et al. (2000) discuss strategies specifically for preventive medicine.

Description of the reliability and validity of specific assessment tools is beyond the scope of this study. However, teachers need to take these criteria into account, as well as the educational effect, feasibility and acceptability tools (Norcini and Mckinley 2007).

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### IMPLICATIONS FOR PRACTICE AND RESEARCH

More detail on the implementation of the teaching, learning and assessment strategies can be found in Chapter 7. Implications of complex theory will be taken into account in designing the curriculum. For example, 'creativity, innovation and flexibility depend on there being slack, spaces or spare capacity in a system; secondly, a part of complex learning is the undermind's unhurriable slow learning' (Claxton 1998, in Knight 2010). So, curriculum planning for complex learning needs to be concerned with the spaces, interactions, experiences, opportunities and settings in which formal learning takes place (Knight 2010; Jess, Atencio and Thorburn 2011). Time for reflection, planning and portfolio-making should be built into the curriculum. Planning starts by imagining how to draw together the processes, encounters or engagements that make for good learning (Knight 2010).

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Doll's warning us to be cautious about using too rigid a syllabus — instead using one which is rich in problematics (Doll, 1993, ch. 7), is taken into account in recommendations for the curriculum in Chapter 7:

The power inherent in such richness is brought forth as students—individually or in groups—work on various texts which web together into a frame that combines closure with openness, a modest rigidity with a structured flexibility. As students work on these various texts, the aim is not for all to be on the same page at the same time but, contrarily, for groups within the web to be on different pages, in different texts, at the same time. Embracing complexity, the aim is for a process of crossfertilisation, pollination, catalyzation of ideas. Over time (an important ingredient for both Prigogine and Kauffman) a network of connections and interconnections becomes more and more webbed. Learning now occurs, not through direct transmission from expert to novice, or from teacher to student, but in a non-linear manner through all in a class exploring a situation/problem/issue together (and indeed from multiple perspectives) (Doll 2008: 202).

As with the use of learning theories, the optimal curriculum should draw on different perspectives, using, but not exclusively, complex theory (Jess, Atencio and Thorburn 2011). Other useful curriculum frameworks are the SPICES and the PRISMS models (refer to Appendix Y).

## 7. CONCLUSIONS AND RECOMMENDATIONS

*We do not learn from experience  
we learn from reflecting on experience.*

John Dewey

### INTRODUCTION

This chapter summarises the findings from the thesis in the three research phases, gives an evaluation of the research and provides recommendations for practice and research.

The overall aim of the study was to develop standards of competencies, and teaching, learning and assessment strategies for an undergraduate community and public health physiotherapy curriculum. Studies were carried out in three phases in agreement with the three research objectives, which were:

1. To conduct a situation analysis of the context of community physiotherapy.
2. To clarify the expectations of stakeholders about the standards for undergraduate community physiotherapy education.
3. To develop standards of education for undergraduate community physiotherapy.

The main conclusions from these studies are presented in this chapter, followed by an evaluation of the research, implications for practice and suggestions for research.

The study process initially introduced in Chapter 1 is again shown in Figure 7.1.

CHAPTER 7. Conclusions and recommendations

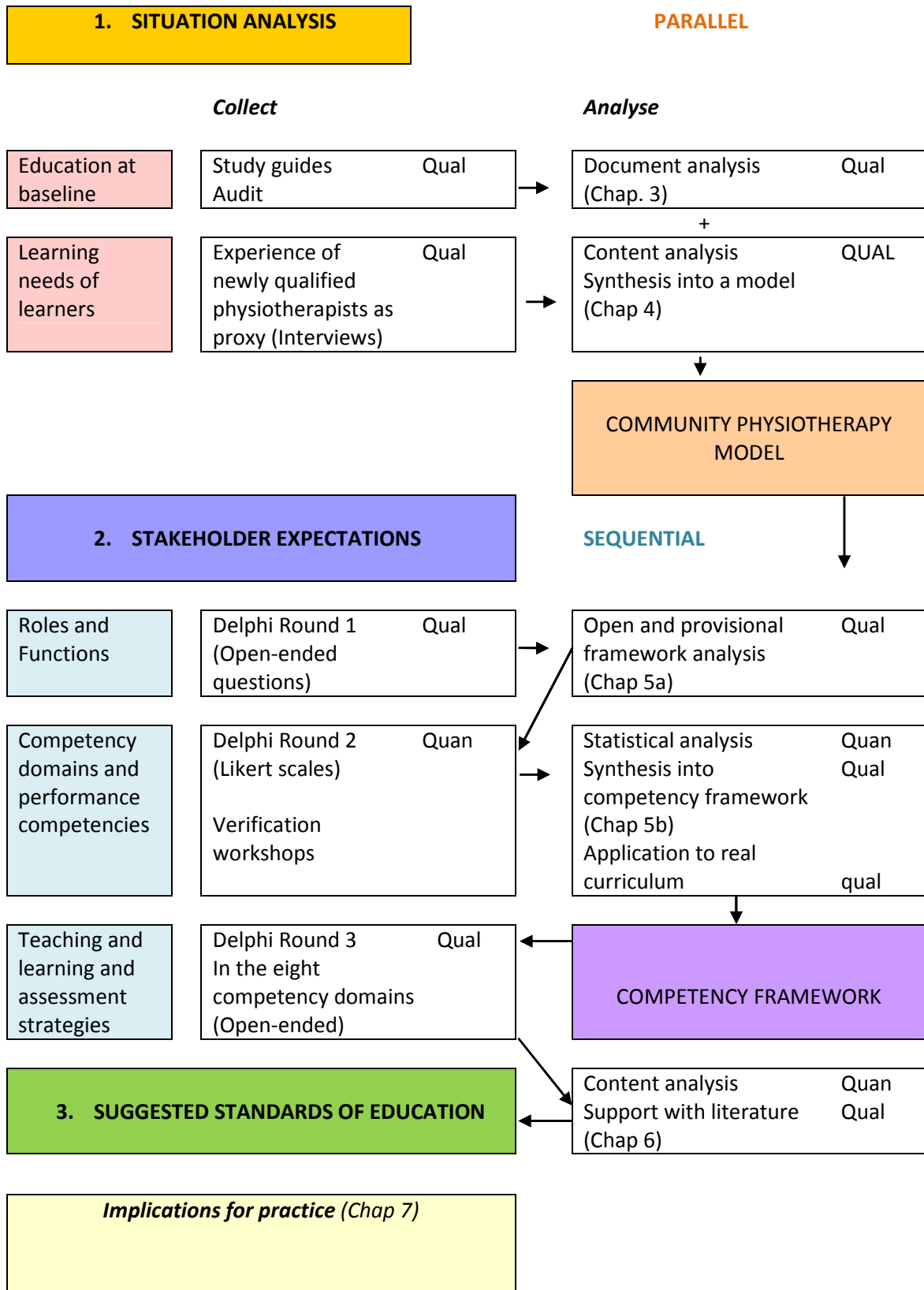


Figure 7.1. Flow diagram of the research process

## CONCLUSIONS

### SITUATION ANALYSIS

From the first investigation in Phase 1 it was concluded that the graduate physiotherapist has an important role to play in the current health policy environment. The quadruple burden of disease of the South African population would benefit from physiotherapy, in terms of acute injuries, chronic disease of lifestyle and conditions with episodes where rehabilitation is needed, such as AIDS. In preparing the graduate for this challenge, it appears that all eight the universities have gaps in their community and public health study guides and could benefit from benchmarking against current policies. Of the gaps highlighted, the elements of the re-engineering of primary health care, for example, would need more attention. Service-learning projects could expand to include school health programmes. Graduates will also have to be able to work with and empower mid-level workers. In this first phase of the study, it became clear that students need a far broader array of competencies than only that of the clinician role.

The second investigation of Phase 1 brought the comprehensive nature of physiotherapy community-settings to the fore. The model in Figure 7.2 summarises the findings as described below.



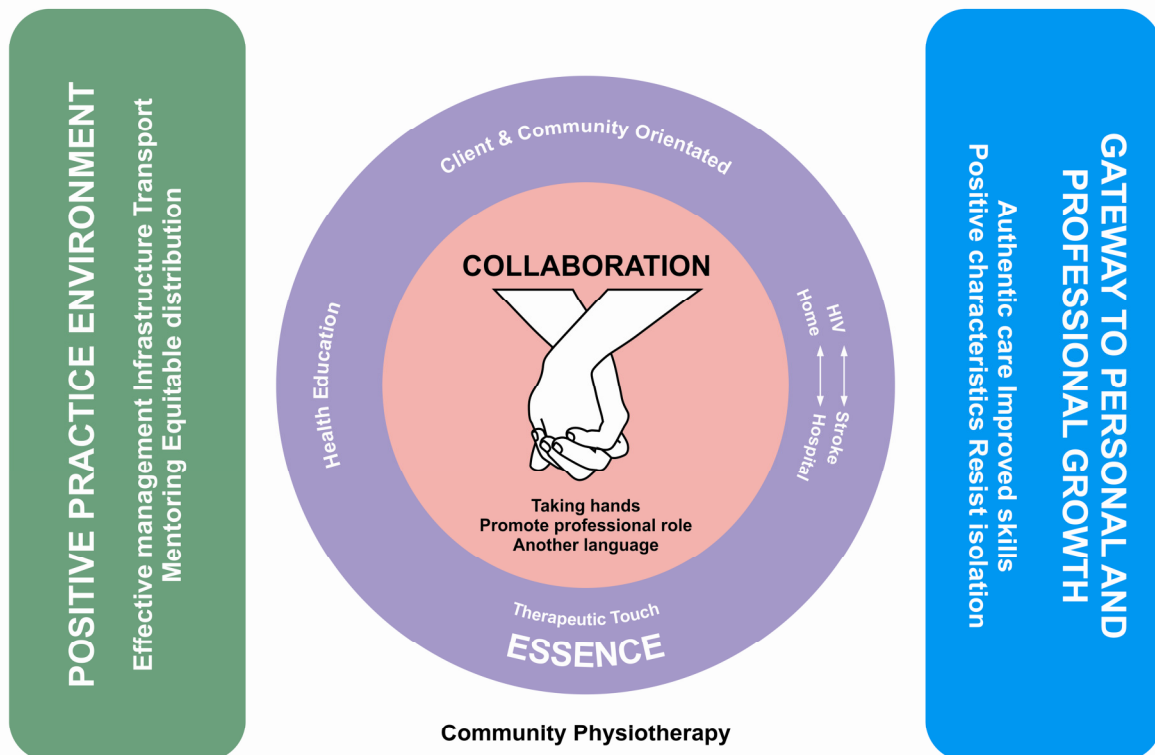


Figure 7.2. Model for compulsory community physiotherapy

Services are delivered over the lifespan, to conditions mirroring the quadruple burden of disease, in settings varying from hospitals to homes of clients, with a great emphasis on health promotion and stressing the benefit to patients from therapeutic touch during one-on-one treatments. A positive practice environment needs to support the physiotherapy service with effective management of the services that community physiotherapists join. A benefit of a compulsory community service year is that it offers a gateway to professional and personal growth. The reality of a sub optimal practice environment has the implication that graduates need resilience to cope during the year. They need awareness of the importance of identifying a mentor, in the frequent absence of a profession-specific supervisor.

PROFESSIONAL COMPETENCY FRAMEWORK

In the second phase of the study, clarification of a definition of community physiotherapy was obtained, with three core knowledge and skill sets identified; i.e. clinical physiotherapy, population health and community development. Consensus was also reached on professional competency domains as shown in Figure 7.3.

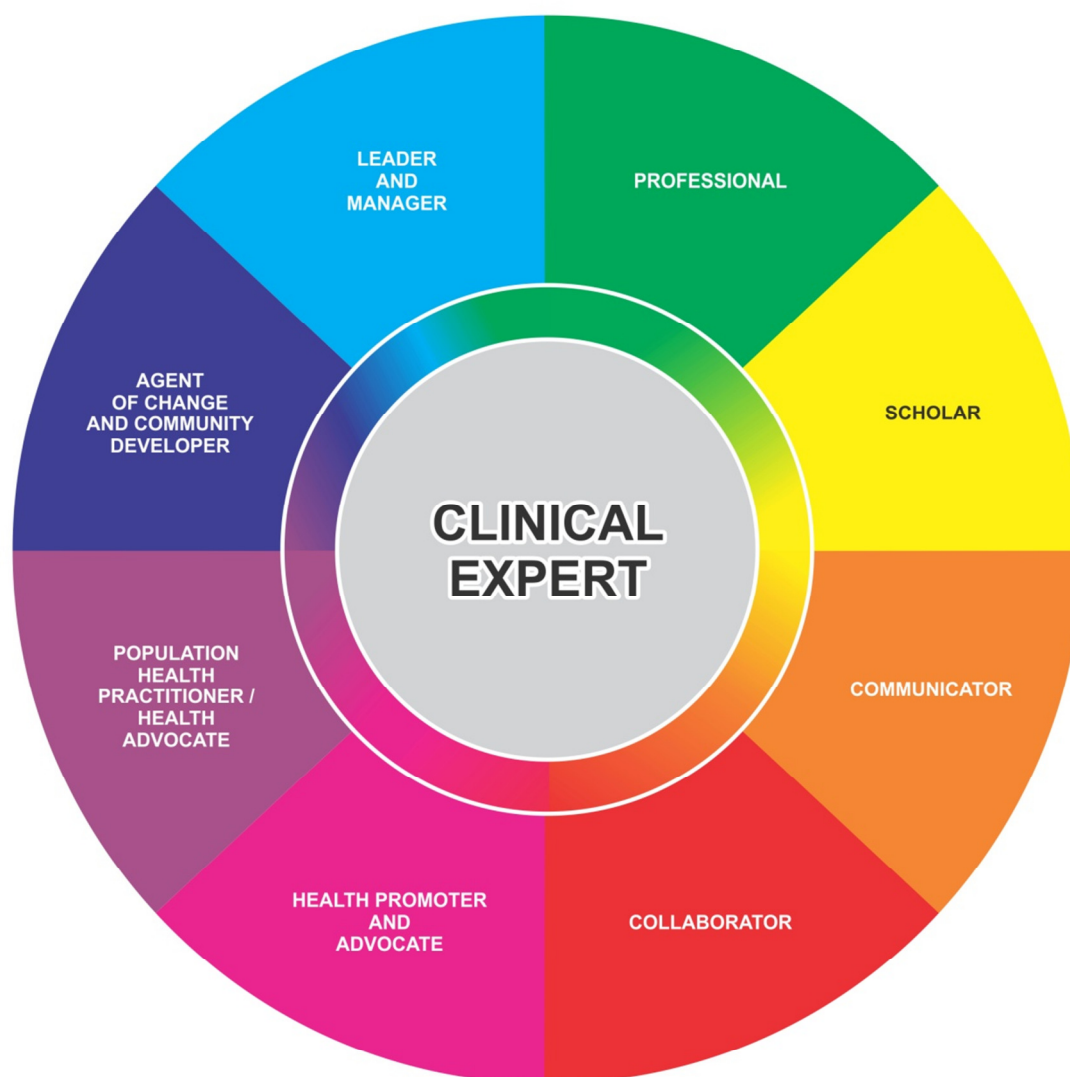


Figure 7.3. The Kaleidoscope Competency Framework

## CHAPTER 7. Conclusions and recommendations

The central role of clinical expert was confirmed during this phase. Although participants were probed about community and public healthcare, four other roles scored higher in importance, which included that of a scholar, communicator, collaborator and health promoter. The roles that scored in the lower half of participant preference were that of public health practitioner, community developer/agent of change and manager and leader. Students need education in all of these roles in different settings as is the case with higher level competencies such as these professional roles.

In the role of professional, a graduate acts as self-directed, reflective, ethical life-long learner who practices in a culturally competent way. The graduate is competent to communicate in patient-, family- and relationship-orientated ways and collaborate effectively with medical and other team members. As scholar the graduate's work is inquiry based and the graduate is skilled in finding, appraising, applying and generating scientific evidence. In the health promoter role counselling skills are applied to facilitate healthy behaviour, provide age- and culturally appropriate health education and screen for risk factors. As public health practitioner graduates understand the effects of the social determinants of health and the distribution of risk factors and diseases. They implement evidence-based community wellness projects and give input to, and comply with, relevant health policy. The ICF provides a framework for work as community developer to integrate people with disability into society. Locality development, social action, social mobilisation and social planning are implemented to facilitate change in healthcare and to increase the level of involvement of community members. Lastly, graduates act as leaders and managers in their own careers and physiotherapy departments.

In the third phase of the study (round 3 of the Delphi) a range of teaching and learning strategies were identified that are appropriate to educate physiotherapy students in the different professional roles that support community and public health physiotherapy. Engaging, authentic strategies were prioritised, such as case analysis and service-learning.

Reflection is a key component of the curriculum. For example, reflection for a service-learning block could happen before the placement starts to identify personal and professional development goals; during the block to monitor and modify performance, to

## CHAPTER 7. Conclusions and recommendations

identify further learning goals, and to link practice with theory; and afterwards to identify lessons for similar future working situations.

A range of activities to stimulate reflection was suggested. These included projects, e.g. a community-based wellness programme; reflective essays, e.g. on how the community's health is influenced by societal factors; participation in a journal club about evidence for community interventions; presenting interventions to community partners; research reports e.g. on participation in epidemiological surveys; and developing a policy to address limitations in the current service and others.

Of essence is that the community placement offers opportunities for dialogue; e.g. during small group teaching sessions, joint evaluation of projects with community partners, mentoring conversations with a supervisor working with evidence from the portfolio, informally reflecting with peers, individual reflection on learning tasks and working on the learning portfolio. A public health blog is a possibility for facilitating a community of practice of students, clinical staff, community partners and academic lecturers.

Although a whole array of assessment tools was described in this study, core to assessment for professional competencies is for the students to be able to give evidence of their own learning (e.g. in a portfolio or oral examination) and to get frequent formative feedback.

The recommended standards were in line with a competency-based educational programme compared to a content/process-based one (Iobst et al. 2010): as the driving force for the curriculum is the competencies (not content); responsibility for learning lies with the learner (not the teacher); the goal of educational encounters is knowledge application (rather than knowledge acquisition); the typical assessment tool is multiple objective measures – “evaluation portfolio” – rather than a single objective measure; evaluation is criterion-referenced (rather than norm-referenced); and the timing of assessment emphasises formative rather than summative assessment.

### EVALUATION OF THE RESEARCH

An overall mixed method research approach was used for this study, each contributing phase of the study was conducted in either a qualitative or a quantitative way; each strand

## CHAPTER 7. Conclusions and recommendations

had its own methods, results and inferences. The design was suitable for answering the research question and within-design consistency occurred, as strands linked in a logical, seamless manner. Limitations of each study are discussed in each corresponding chapter. The overall mixed method design integrated the findings from the different studies effectively. The first two studies that formed the situation analysis (context and document analysis of study guides, and the exploration of the experience of compulsory community physiotherapists) happened concurrently. The findings from both, together with the findings from the first round of the Delphi, study 3, were used in the development of the round-2 questionnaire. The quantitative data from round-2 were used to develop the qualitative Kaleidoscope Competency Framework, which in turn formed the framework for the round-3 qualitative exploration of standards of education.

Pragmatism as the guiding theoretical paradigm is defended in Chapter 1 together with the corresponding epistemological, ontological, methodological and theoretical framework. Pragmatism proved suitable as an underlying philosophical framework for the study. On the other hand, the Six-step model was perhaps an unrealistically rational approach, the implementation of which may not be as straightforward as initially promised.

Another strong point of the research is the interpretive rigour, again shown by the seamless integration of findings from the qualitative and quantitative strands of the research into the final meta-inference. The final findings are aligned with the original research purpose and question.

### SUMMARY OF THE CONTRIBUTION OF THE RESEARCH

Phase 1a gives a review of the current health policy situation in South Africa, of use not only to the physiotherapy profession, but also to other health professions. The study further provides a benchmark of themes and competencies relevant to community and public in the undergraduate physiotherapy curriculum.

Phase 1b contributed the first model, known to the author, for compulsory community physiotherapy in South Africa, clarifying the essence of the service, the practice environment and the new graduate's professional and personal development. In contrast to

## CHAPTER 7. Conclusions and recommendations

similar models in other disciplines, the author did not recommend that the practice environment be improved, as that is a long-term project not under the control of the physiotherapy educator nor of the new graduate. Rather, the study provides a point of departure to prepare the student suitably for the practice environment.

Phase 2 is the highlight of the thesis, in the sense that the professional competency domains for community physiotherapy were made explicit. The study contributed unique roles for physiotherapists compared to other health professions with similar competency frameworks, using frameworks for curriculum development internationally, but also in South Africa.

Study 4 contributes a concise overview of possible teaching and learning, as well as assessment strategies – standards for teaching – as a useful point of departure for curriculum and even syllabus revision. The study also applied some features of complexity theory to undergraduate community physiotherapy curriculum development.

Another contribution was to introduce the term “public health physiotherapy”. At the start of the study the term “public health physiotherapy” was not an acceptable term. It was not allowed in the proposal for this study, although public health nursing, public health pharmacy, public health dentistry and public health nutrition, for example, were used in literature (Passmore and Kailis 1994; Campbell, Fowles and Weber 2004; Caraher and Cowburn 2005; Bawden 2007). A manuscript from the research had been accepted by a peer-reviewed journal with the term “public health physiotherapy” in the title (Mostert-Wentzel, Frantz and van Rooijen 2013a).

The sequential mixed method design conducted in this research adds another case to the repertoire of mixed methods designs used in physiotherapy, as it is one of the three mixed method designs that are not often used in physiotherapy (Rauscher and Greenfield 2009).

In addition to its theoretical and methodological contribution, some findings from the research have been implemented at the Department of Physiotherapy, University of Pretoria. Initial implementation of findings from the research was provisionally approved (final report outstanding at the time of writing) by the accreditation board of the HPCSA,

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which visited the physiotherapy department at the end of 2012. Other stakeholders such as the community partners and clinical supervisors of the community/public health placement voiced their support for changes implemented in 2013.

The study also has potential social impact. The rationale for the study argued that relevantly educated physiotherapy graduates have the potential to make a relevant positive impact on the health status and health care of the country.

### PRACTICAL IMPLICATIONS

#### FOR THE CURRICULUM

##### Phase 1a

- For physiotherapy university departments to benchmark their curricula against
  - The philosophies, outcomes, teaching and learning strategies, target populations and settings used by other universities
  - Current health and policy issues

##### Phase 1b

- To introduce case studies of scenarios that rely on new graduates during their compulsory community service year
- To foster the skills necessary to function in a sub optimal environment; e.g. to work with a mentor; to reflect before, during and after practice; to problem-solve during service-learning projects; to be part of a community of practice; to learn with others and to develop attributes, such as resilience

##### Phase 2

- To use the competency framework as guideline for curriculum planning, and to guide student learning and assessment

##### Phase 3

- To enrich the teaching environment of students with opportunity for relationships and conversations, as well as innovative teaching and learning and assessment

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FOR REHABILITATION MANAGERS

Phase 1b

- Managers could facilitate the continuation of the journey of self-reflection and further strengthen this during performance appraisal and coaching of young physiotherapists.
- Policies could be developed around professional specific supervision, even by phone or Skype or augmenting the system (“buddy”) currently provided by the South African Society of Physiotherapy.

Phase 2

- The framework could guide standard setting and performance appraisal of young physiotherapists.

Phase 3

- Continuous professional development programmes can be enriched by the ideas about teaching and learning and assessment from this study.

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FOR ACADEMICS

- To start a special interest group of the South African Society of Physiotherapy for community/public health physiotherapy<sup>5</sup>
- To start a list service to share ideas about the curriculum<sup>3</sup>
- To embark on joint teaching and research projects

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IMPLICATIONS FOR PHYSIOTHERAPY EDUCATION AT THE UNIVERSITY OF PRETORIA

- Curriculum organisation

Where the bulk of Professional Development and Community/Public Health study units had previously been addressed in the final years of the curriculum, now 20 additional

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<sup>5</sup> For more detail contact the researcher at [Karien.mostert@up.ac.za](mailto:Karien.mostert@up.ac.za)



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periods have been allocated to introduce the professional competency roles in the first year of study.

- Coherence within a spiral curriculum

The different competencies introduced in the first year are revisited in different modules through integrated learning and assessment opportunities. Tables 7.1 to 7.3 show examples for each competency domain.

**Table 7.1. Examples of educational standards in the Department of Physiotherapy, University of Pretoria for the role of the professional**

<b>Role</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>Professional</b>	Introduction to ethical issues and the codes of ethics of the statutory body (Health professions council)	Solving ethical issues in integrated paper cases	Solving and reflecting on ethical issues in clinical practice Module on Medical Ethics	Solving and reflecting on ethical issues in community settings
	Knowing the self (SOCKS analysis) Cultural competency: cultural sensitivity Understanding diversity Values and norms (self and class) Reading assignments Movies with discussions, e.g. "Yesterday"	Diversity introduced into integrated paper cases (patients of different ages, genders, socio-economic background, sexual orientation, mother tongue)	Managing diversity within the clinical environment complemented by reflections and discussions	Managing diversity in a community placement

**Table 7.2. Examples of educational standards in the Department of Physiotherapy, University of Pretoria for the roles of the communicator and collaborator**

<b>Role</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>Communicator</b>	Giving feedback to a peer during practical classes when acting as models for each other	Feedback to a peer in an interview a) during a role-play b) with a simulated patient	Feedback to clients on e.g. compliance with home programmes	Feedback to community partners
<b>Collaborator</b>	Socialise with other health professionals Joint classes with health professionals Joint health education session Using technology  Small groups: roles and norms	Interviews and reports about the role of other members of the team	Referrals to other health team members on clinical placements Referrals to members from other sectors, e.g. teachers Work with mid-level workers  Group dynamics, handling groups	Working with volunteers, mid-level workers, partners from NGOs and GBOs, the local healthcare system, e.g. the rehabilitation team at the community health centre.  Group techniques like nominal group technique

**Table 7.3** Examples of educational standards in the Department of Physiotherapy, University of Pretoria for the roles of scholar and health promoter

<b>Scholar</b>	Finding evidence Summarising evidence, e.g. for a presentation	Apply evidence to paper cases	Apply evidence in the treatment of patients	Apply evidence to community- based and public health interventions
	Appraise a systematic interview	Appraise a randomised control trial	Appraise a prognostic study Interpret biostatistics	Appraise a diagnostic study
<b>Health promoter</b>	Introduction to life-style diseases The physiotherapist as a role model of health behaviour	Consultation skills (interviewing a patient) Health education strategies (dramas, etc.)	Consultation skills applied in brief motivational interviewing - Role play in class (pairs – fishbowl) - Simulated patients - OSCE (integrated case) - Case study from an intervention during clinical placement -Health education for people with low levels of literacy	Health education to groups of clients in the community Preparing a press release about a health issue Wellness programme in the community

**Table 7.4. Examples of educational standards in the Department of Physiotherapy, University of Pretoria for the roles of the population health practitioner, community developer and leader/manager**

<b>Role</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>Population health practitioner</b>	Introduction to the concepts in public health (e.g. risk factors, epidemiology)	Applying concepts to paper cases	Applying concepts to patients	Applying concepts in a community/public health setting
<b>Community developer</b>	-Spending time with a family with a person with disabilities -Introduction to the ICF	-Spending a week with a poor family -Applying the ICF and determinants of health to paper cases	Applying the ICF and determinants of health to patients	Developing/working with support groups and structures Applying the ICF in community/public health settings
<b>Manager/leader</b>	Getting to know the health system: Visit to community project combined with discussion of the referral institutions	Project at an NGO, e.g. home for people with disabilities	-Working in different settings, including hospitals, homes for the elderly, rehabilitation settings -Watching a documentary, e.g. "Sicko" and reflecting on differences and similarities between Cuba, UK, France the UK and SA	Working in community settings

## CHAPTER 7. Conclusions and recommendations

The researcher evaluated the current (2013) curriculum against the recommendation from this study. The performance competencies identified in Chapter 5 were listed by professional role in the first column of tables 7.4 to 7.13. Then the themes/tasks that need to be included in the curriculum were added by study year (second to last columns). These themes/tasks were then evaluated against the current (2013) curriculum of the Department of Physiotherapy, University of Pretoria. Elements not explicitly addressed in the written curriculum are marked white, those that are only partially addressed are marked in grey, and those covered in current subjects (offered by the department, as well as service modules) are marked in the colour of the specific year group.

**Table 7.5. Themes/tasks by performance competencies for the role of clinician by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Clinician</b>				
Optimum patient independence	ICF	Patient-centred communication	Applied in FTP	Applied in FTP
Appropriate interventions	FTP	FTP: different diagnoses, ages, pathology, social circumstances	Applied in FTP	Applied in FTP
Different settings	Visits as part of FTP	Visits as part of FTP: schools, homes for persons with disability	FTP hospitals, old age homes, rehabilitation centres	As in 3 <sup>rd</sup> year plus: domiciliary service, hospices work with NGOs

**Table 7.6. Themes/tasks by performance competencies for the role of professional by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Professional</b>				
Comply with policies and laws	Introduction to policy making House committee, departmental, and university policies	Sexual harassment policies (protecting sexual boundaries)	Clinical policies and management policies	Country laws and international policies related to health
Comply with statutory regulations	Join HPCSA	Member of HPCSA	Member of HPCSA	Introduction about CPD
HPCSA codes of conduct		Ethical	Medico-legal	Private practice
- Professional Association	SASP Code of Practice		SASP Position papers: midlevel workers Rehabilitation	Introduction to WCPT
Ethical and professional	Introduction	Principles for ethical decision making Human and patient rights	Applied in clinical settings MRZ 310	Apply frameworks for ethical thinking in public health
Aware of own strengths and weaknesses	Learning style		Leadership profile	
First-line professional	FTP	FTP	FTP	FTP
Manage own stress and be resilient	Reflection Personal goal setting		Stress management Clinical placements (FTP)	Clinical placements (FTP)
Reflective and life-long learner	Introduction	Portfolio	Clinical placements (FTP)	Clinical placements (FTP)
Open for peer-appraisal	Small groups (giving feedback)	Communication practical exercises and tests	Peer-review	Peer review
Critical and systemic thinking	Intro to systems theory			Intro to complexity theory
Caring	Reflection about suffering	Clinical placements (FTP)	Clinical placements (FTP)	Clinical placements (FTP)
Self-directed learning	Learning style analysis			
Part of a community of practice	Participation on social network and course wiki	Online discussion forum	Online discussion forum	Online discussion forum
History, philosophy and role of physiotherapy	Intro	Revise	Clinical placements (FTP)	Clinical placements (FTP)



Table 7.7. Themes/tasks by performance competencies for the role of communicator by year of study

Professional competency role	First year	Second year	Third year	Fourth year
<b>Communicator</b>				
Patient-centred communication	The patient's narrative from art: reflection	Principles of adult education	Clinical placements (FTP)	Clinical placements (FTP)
Interviewing skills	Patient's perspective	Patient consultations (simulated patients)	Clinical placements (FTP)	Clinical placements (FTP)
Effective communication with clients with low levels of literacy		Intro	Clinical placements (FTP)	Clinical placements (FTP)
Value diversity and cultural competence	Diversity and cultural sensitivity: reflection		(Previously covered here)	
Patient education	One-on-one	(Low literacy) Currently one target group		
- Different targets	Group contribution (peer)		Clinical placements (FTP)	Clinical placements (FTP)
- Different channels	One-on-one African language (Sepedi (SEP) 101 OR Zulu (ZUL) 110	Demonstration, role-play, drama, brochures, anatomical models, anatomical sketches	Clinical placements	Clinical placements (FTP)
- Different multimedia	MS PowerPoint to class	Video	Clinical placements	Clinical placements (FTP)
o Written	Write down exercises (FTP)	SOAPE notes simulated patients	Clinical placements	Clinical placements (FTP)
			Discharge notes	
			Medico-legal reports	
	Assignments in English for Health Sciences (ELH) 121 122		Case report	Scientific article FTP 402
- Use information technology	Library databases, (Academic Information Management (AIM) 101		Research proposal	
				MS Excel – data capturing

**Table 7.8. Themes/tasks by performance competencies for the role of collaborator by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Collaborator</b>				
Coaching and mentoring	Mentee	Mentor		
- Work with interpreter		Models and simulated patients	In clinical settings	In community settings
Group dynamics	Team member (assignments)	Get to know the team	Work with the team	Community and intersectoral networks
			Family-centred interventions	
Conflict management	Conflict Management unit			Negotiation skills
- Give feedback	Peers (on group interaction)	Peers (on interviewing skills)	Patients Team members	Community partners

Table 7.9. Themes/tasks by performance competencies for the role of scholar by year of study

Professional competency role	First year	Second year	Third year	Fourth year
<b>Scholar</b>				
Find information	AIS 101	Assignments	Assignments	Assignments
Evaluate research and use evidence: Applied in all other roles	Intro EBP: Systematic reviews Evidence for communication and team work		Statistics South Africa Clinical practice and portfolio Evidence for patients Evidence for departmental and practice management	CBOs, clinics Evidence for community-based and population health interventions Programme management
- General and systematic reviews	X			
- RCT				
- Clinical guidelines				
- Prognostic studies				
- Diagnostic studies				
Develop evidence	AIS assignment and presentation (group) – inquiry-based teaching		Case report	Research project
Identify priority determinants of health				
Interpret biostatistical data				
- Descriptive statistics simple and CI		x		
- Odds ratios/Risk ratios and analytical stats			x	

**Table 7.10. Themes/tasks by performance competencies for the role of health promoter by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Health promoter</b>				
Individuals (Self-responsibility)				
- Health promotion	To act as a role model for health Stress relief assignment	Groups	Clinical settings(FTP) Motivational interviewing	Occupational and community settings (FTP)
- Address risk factors				
- Tele-health				X
- Occupational wellness programmes				X
- Sports clubs	n/a	n/a	Clinical setting (FTP)	X
- Screening				X
- Communities				See Population/Public Health in the chapter on the next page

**Table 7.11. Themes/tasks by performance competencies for the role of public health practitioner by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Public health practitioner</b>				
Diagnose health problems in the community	Clinic/Community visit	Social determinants of health (visit) Community mapping during elective clinical block	Community development project	Community-based placement
Interventions to address risk factors and prevent injury	Learn about risk factors (clinical role)	(Health education)	(Motivational interviewing)	(Awareness raising)
Monitor health status	Paper patients	Paper patients	Individual clients (FTP clinical)	
Promote health	See health promotion role as well			
Improve accessibility	Awareness Poverty		Theory project management and management	Develop services
Occupational physiotherapy	Intro	Ergonomics	Subjective	Workplace analysis/screening

**Table 7.12. Themes/tasks by performance competencies for the role of community developer/agent of change by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Community developer/Agent of change</b>				
Assistive devices (e.g.)		Measure devices (FTP)	Order assistive devices and orthoses/prostheses and wheelchairs in clinical settings	Order wheelchairs in community settings
ICF	Intro	Intro	Clinical practice (FTP)	
Responsive to the social needs				
- Social determinants of health	Intro	Community visit	Take into consideration for patient plans	Take into consideration for community interventions
- Community interventions à la Rothman (2000 and 2008) <sup>a</sup>	Intro		CBR and community PT	
Impact of disability	Shadow a family		Clinical setting Models of disability	Community settings
Use low cost technology				Community settings
Disability environment	Get to know			Work with PwD
- NGOs	Map during visit		Refer to	Work with
- DPOs				
- WHO				
Set up support systems	n/a	Patient empowerment	n/a	x
Diminish stigmatisation because of disability			Involve care givers	Awareness Days
Equalisation of opportunities for persons with disabilities				Access project

<sup>a</sup> Social planning, community mobilisation, social action, community (locality) development

**Table 7.13. Themes/tasks by performance competencies for the role of leader/manager by year of study**

Professional competency role	First year	Second year	Third year	Fourth year
<b>Leader/manager</b>				
- Role in the health system	Getting-to-know-the-health system	Systems in Health Care(SOH) 251	Clinical practice (FTP)	Clinical practice (FTP)
- Manage physiotherapy services	Visit		Management and leadership skills and application in departments	Project management
o Clinic/ Department	Visit	Elective (broader assignment)	Clinical practice (FTP)	Clinical practice (FTP)
o Rehabilitation centre			Clinical practice (FTP)	Clinical practice (FTP)
o Mobile service			Clinical practice (FTP)	Clinical practice (FTP)
o Palliative centre			Clinical practice (FTP)	Clinical practice (FTP)
o CBR programmes			Clinical practice (FTP)	Clinical practice (FTP)
<b>Market physiotherapy</b>				
- Individuals			X	
- Team members			X	X
- Public				X
<b>Health workforce</b>				
- Therapy assistants			X	
- Volunteers				X
<b>Manage human resources</b>				
Assure quality			X	X
Assure safety				

## CHAPTER 7: Conclusions and Recommendations

The use of all nine competencies in the framework as planning outline for the curriculum proved to be cumbersome. For the purpose of designing and sequencing the curriculum, the competencies were therefore integrated into four categories: Clinical Practice, Public Health (including health promoter and manager/leader), Community Development in Health and Professionalism (including communicator, collaborator and scholar).

Clinical practice is learnt in the Physiotherapy modules (FTPs); the other competencies is currently learnt in the module Professional Development and Leadership (POL), which runs from the second year (semester course) to the fourth year, and service modules. The service modules include a module that introduces students to the competency to find and use evidence (AIM 101), a module on one of the indigenous languages of the country (Zulu or Pedi) (ZUL 110 or SEP 110), a module on systems in health care (SOH 251), and a module on ethics and law in health care (MRZ 310).

Some recommendations of how to address the gaps in the curriculum listed in tables 7.4 to 7.13 are made in the next four sections.

Before the curriculum was revised, time in the curriculum for first years had been sought. At the end of 2012 the department carried out a number of curriculum workshops. One aim was to align the number of hours in the programme with the prescribed minimum requirements of the HPCSA. The programme had too many hours and some non-core units were shortened and study units were moved between years. In this way 20 periods became available in the first year for the purpose of beginning to prepare students for the professional roles identified in this research. The number of periods for POL stayed the same.

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### CLINICAL PRACTICE

Education for clinical practice currently takes place in the subject Physiotherapy (FTP 100, 200, 300 and 400). Fundamental principles of physiotherapy (movement, electrotherapy etc.) are scheduled for the first year according to anatomical regions. Students are introduced to clinical cases early on. They also observe physiotherapy of real-life patients in



## CHAPTER 7: Conclusions and Recommendations

clinical areas and during an elective placement in the second year. From the third year onwards the focus of the syllabus is on clinical placements in the different fields of physiotherapy (neurology, orthopaedics, etc.). Students work in a variety of clinical placements, such as hospitals, clinics, out-patient departments, homes for the elderly, special needs schools, sports and rehabilitation centres. On community placements they also work with CBOs, such as NGOs, DPOs and FBOs on wellness programmes.

Innovation that has been implemented since the start of this research includes horizontal integration in the curriculum (Dent and Harden 2009) – integration of different fields of physiotherapy within one learning and teaching or assessment opportunity. Horizontal integration between physiotherapy and professional/ethics/communication fields takes place during workshops arranged according to the body area (trunk, shoulder and upper limb, hip, and ankle and foot). Students receive cases ahead of time with structured tasks to be carried out as a group. The final presentation is discussed with a panel of lecturers from different physiotherapy fields. Ethical and professional issues, determinants of health and variation in diversity according to, for example, gender, age, socio-economic level and ethnic group are integrated into the cases. Similar case studies are used in practical tests and examinations on models and simulated patients, with integration between the physiotherapy fields. The OSCE practical sessions with models include a communication station(s) and health education.

In addition to clinical presentations and block reports, since the previous year (2012) clinical students have been assessed through a portfolio of evidence of evaluation of a patient, appraising evidence related to an intervention and a clinical issue, and weekly reflections. This is, however, only a summative and not a formative portfolio. Since the start of the study (2009) a bi-annual reflection has also been implemented on an issue in the clinical set-up, specifically linked to the subject Professional Development and Leadership (POL). The incident that students reflect on can be about conflict, diversity, leadership, stress, accompanying a terminally ill patient and others. A standardised rubric is used for assessment (O'Sullivan, Aronson, Chittenden et al. c. 2011).

Students also write up a case where they consulted a client about health behaviour change, such as tobacco-smoking cessation or compliance with a new exercise programme.

Limitations in the curriculum are a lack of integration – both horizontal and vertical – during the clinical years (years 3 and 4). Furthermore, clinical education does not take place in rural and remote areas because of cost implications. Furthermore, ethical/professional and management issues are not explicitly integrated into clinical teaching.

## RECOMMENDATIONS

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### 1. Rural and remote placements

- a. A placement in a deep rural area should be investigated. (The rehabilitation manager offers an annual workshop on rural rehabilitation at the Pretoria Physiotherapy Department.) This can be achieved in a staged way, starting with volunteers from the class who are prepared to carry their own transport and daily subsistence costs. Accommodation might be arranged with the rehabilitation facility.
- b. In order for all students to benefit from the learning during this placement, students should keep a blog, and a guided reflection in the class setting could be arranged.
- c. In parallel, funding opportunities for such a placement can be identified and applied for, initially within a 50 km range from the campus, where a similar placement has had to be stopped due to financial constraints.

### 2. Longitudinal clinical attachments

- a. Students are to be allocated to groups that are as diverse as possible in terms of characteristics such as gender, level of previous education, mother tongue, etc. (Michaelsen, Knight and Fink 2004) for team-based and clinical education. Students stay in these groups for the whole course (Abdelkhalek, Hussein, Gibbs and Hamdy 2010).

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- b. In first and second year visits should be arranged to the clinical areas where community-based education takes place to observe treatments and apply techniques within their scope of practice.
  - c. Third and final year community placements at these same clinical areas should take place. (Students should be allocated to the same community that they visited in their first and second years.)
3. Professional development
- a. Students need to learn formally how to reflect, probably already in the first year.
  - b. Current reflections need to be upgraded with a formative element. Reflection should include goal setting by each student at the start of the four-week block and self-evaluation of the achievements on the block.
  - c. Discussions with a clinical mentor should be held half-way through the block.

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### PUBLIC HEALTH

Currently students are introduced to public health, including the management of physiotherapy departments and projects and occupational health, only in the fourth year and with limited scope. (Two lectures on Leadership take place in the third year.)

### RECOMMENDATIONS

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A first year study unit should be introduced on public health, with special emphasis on the determinants of health. Themes to be covered at an introductory level could include (de Haan 2005; Schneider 2011; Bic 2012; Fleming and Parker 2011:

- The South African health sector
- What is public health? This could include:
  - History and definitions
  - The core functions:
    - Assessment

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- Policy development
- Assurance (protect health and prevent disease)
- The ten essential services
- The six disciplines
  - Epidemiology
  - Biostatistics
  - Biomedical sciences
  - Environmental Health Science
  - Social and Behavioural Sciences
  - Health Policy and Management
- The determinants of health
- Health protection and health promotion
- The role of data in public health
- Do people choose their own health?
- Introduction to management (the United States Agency for International Development (USAID) model)

Team-based learning (Michaelsen, Knight and Fink 2004) would be appropriate in the same teams as mentioned under Clinical Practice.

Group work would include tasks during visits to a community-physiotherapy programme, such as holding interviews with different stakeholder groups to identify the determinants of health in that community, the links with other levels of the health system and other sectors, such as education, and behavioural health risks.

Elective tasks could be selected from:

- Getting an intimate look at disability – spending time with a family with a person with disability
- Getting an intimate look at poverty – spending time with a poor family
- Screening – a simple screening session linked to follow-up services

Currently the first year includes a brief introduction to health education. Students present a lecture on back care to radiography students. This study unit may be expanded to cover the following themes (Green 1980; Ehlers 2002; Naidoo and Wills 2009):

- The theory of health promotion
- The health settings' approach to health promotion
- The PRECEDE model of health education
- Implementing health promotion (assessing, planning, evaluation)
- Project management

Similar to the first year, a team-based approach should be followed. Tasks in this case could include planning, implementing and evaluating health education sessions in a specific setting, such as a school, workplace and/or prison. This is an ideal task for interdisciplinary collaboration; for example, with the Department of Nursing.

Already implemented in the third year is a study unit to develop personal skills for health promotion. Health behaviour counselling through brief motivational interviewing is taught and learnt. Students are prepared through lectures, videos and class activities, such as role-plays (Rollnick 1999; Lane and Rollnick 2007; Lane, Hood and Rollnick 2008; Mason and Butler 2010). Communications skills exercises and tests/examinations with simulated patients take place in a skills laboratory in consultation rooms with one-way windows. Brief motivational interviewing for health behaviour change is assessed through the BECCI instrument (Lane, Huws-Thomas, Hood, Rollnick, Edwards and Robling 2005).

Basics of the health promotion unit in fourth year are in place, but need to be expanded to include (Zaza, Harris and the Task Force on Community Preventive Services 2005; Carter, Ruhe, Weyer et al. 2007; Naidoo and Wills 2009):

- Strengthening community action
- Developing health-orientated public policy
- Using media in health promotion
- Evidence for community-based health interventions

- Promoting health in neighbourhoods
- Managing a home visit programme

Case-based teaching is suitable for this module and application and assessment happens during the community/public health placement.

In terms of management and leadership the current curriculum provides for two lectures in the third year and one in the fourth year, which is clearly inadequate. As suggested above, students should be introduced to management principles in the first year, project management in the second (combined with the setting-based health promotion project), and then the differentiation between management and leadership and management of community-based projects in the third year (combined with community assessment – refer to the next section), and management of physiotherapy departments (public sector) in the fourth year. The fourth year teaching and learning opportunity could be an elective assignment on a clinical block in one of the following domains and completion of on-line management courses (Hatting, Dryer and Roos 2011; Management Sciences for Health (MSH) 2010) on the following topics:

- Strategic management
- Policies and procedures
- Operational management
- Financial management
- Managing medicines, health products and apparatus
- Human resource management
- Information management

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#### COMMUNITY DEVELOPMENT

The elective tasks in the subject Public Health contribute to understanding communities.

It would be more optimal to introduce students in the first year to the levels of functioning, with the highest function participation in terms of personal independence and age-

appropriate roles in the home, at work and in society. In the current curriculum students learn about the ICF in the second year of study and apply the categories to clients treated in the third and fourth years of study.

Community physiotherapy and community-based rehabilitation (CBR) in the current curriculum are taught in the fourth year (Rule 2006). These units should move to the third year, where they offer another opportunity for multidisciplinary collaboration in presenting the unit. (The Nursing curriculum at the University of Pretoria has a community project in the third year.) A learning and assessment task could be a visit to a local community (the same as the one allocated in first year) for longitudinal clinical attachments. As preparation, a task to map the community where the second year elective takes place should be added to the syllabus for the elective.

Current themes are (Swanepoel and de Beer 2006; Hutchings, Lundrigan, Mathews et al. 2011):

- The development context
- Stakeholders in community development
- The process of community development
- Features and outcomes of community development
- The community as main actor in community development
- The place and role of community development workers
- Theoretical foundations of public health and community physiotherapy
- Developing a community profile by conducting, amongst others, a window shield assessment and a community assessment, using an appreciative inquiry approach, nominal group techniques, focus group discussions, brainstorming and a snowballing group
- Different roles that the physiotherapist may fulfil in a community-based setting
- Differentiating between different levels of preventative measures
- Different models of community-based care

- Different ways of implementing CBR as a strategy for community development, including rehabilitation, equalisation of opportunities and social integration
- Approaches to the development of grass roots workers
- Key issues
- How the health sector fits into the CBR matrix
- The role of physiotherapy in CBR

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## PROFESSIONALISM

Currently communication skills are introduced in the second year and issues around personal development are only covered in the third year. Some of these study units need to move down to first year.

Professionalism can be divided into four categories:

- 1) Know and manage yourself
- 2) Know and manage others
- 3) Know and manage the environment (legal and policy environment)
- 4) Do the right thing (ethics)

## KNOW AND MANAGE YOURSELF

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Current units are:

- Value clarification (own and class) (1<sup>st</sup> year)
- Understanding your leadership profile (3<sup>rd</sup> year)
- Manage stress (3<sup>rd</sup> year)
- Compile a personal *Curriculum Vitae* (4<sup>th</sup> year)



## KNOW AND MANAGE OTHERS

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Current study units:

- Managing diversity and cultural competency (3<sup>rd</sup> year to move to 1<sup>st</sup> year)
- Ethics (MRZ 310)
- Getting to know the team (2<sup>nd</sup> year)
- Preventing and handling sexual harassment (2<sup>nd</sup> year)
- Managing conflict (3<sup>rd</sup> year to move to 1<sup>st</sup> year)

## KNOW AND MANAGE THE ENVIRONMENT (LEGAL AND POLICY ENVIRONMENT)

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Current study units:

- Batho Pele and the Patient's Rights Charter (Systems in Health Care (SOH 251)
- South African and international health policy (4<sup>th</sup> year)

## DO THE RIGHT THING (ETHICS)

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Current study units:

- Introduction to ethical principles (1<sup>st</sup> year)
- Applied to cases (2<sup>nd</sup> year)
- Course on Medical Ethi) (3<sup>rd</sup> year)
- Applied to real patients (3<sup>rd</sup> year – only summative evaluation)

The first year study units need to be developed to address the gaps presented in tables 7.4 to 7.13

Resource implications of the revised curriculum

Preparation: human resources to:

- Develop the rural placement, the entry of longitudinal clinical attachments into these communities, arrangements, agreements, etc.
- Develop the syllabi for additional study units

#### Implementation

- Arrangement and budget for logistics (transport, etc.)
- Supervision, monitoring and evaluation
- Presentation of new study units

#### FOR INTERDISCIPLINARY TRAINING

Interdisciplinary teams that combine the four schools in the School of Health Care Sciences need to be formed for developing joint modules to improve interdisciplinary education (Salas, DiazGranados, Klein, et al. 2008). For example, time tables will have to be coordinated between departments. The ICF could form a central framework to enhance interdisciplinary communication and intervention (Stephenson and Richardson 2008).

#### PERSONAL DEVELOPMENT AND REFLECTIONS

The curriculum for community public health physiotherapy evolved spontaneously without formal pre-planning – through self-organisation and in communication between people. Of course, reading for this study, and analysing the findings were priming factors. However, other facilitating factors were gaining experience in a communication role-play at an on-site fellowship for health professions education; absence of enough time to prepare for a two-hour class that led to the use of the movie “Wit” to facilitate learning about professionalism and accompanying the terminally ill; sharing reading experiences with a colleague who introduced me to the novel “I heard the owl call my name” (Craven 1967); discussion during a PhD support group meeting that introduced me to the USAID electronic handbook for management, where I found the management/leadership framework that currently underpins that theme in the curriculum; doing an on-line course with an open-source education institution and learning about Rothman’s models for community development

that I could use in the fourth year community development module; happenings in the news, such as the bail application in the murder case against the Olympian and Paralympian Oscar Pistorius, which urged me to find a YouTube video of ten years ago, where he talked about his future plans and balancing his life and which sparked a class discussion about professionalism and values.

Other lessons include:

- Small changes may have larger-than-expected outcomes. Two years ago, I introduced a small study unit on reflection. Students reflected twice a semester on a specific theme dealt with in class. A valid, reliable assessment instrument was used. After implementation I realised students needed to be taught how to reflect. I developed a case as an example. Currently I use extended exercises (based on Moon 2004).
- Changes in one element of the system influence others. Learning is absorbed. In response to formal curriculum development planning sessions, where I shared some of my ideas, a young colleague responsible for clinical co-ordination championed the idea of a learning portfolio.

#### SUGGESTIONS FOR FURTHER RESEARCH

1. An internal needs assessment in which students are consulted needs to be undertaken and incorporated into the curriculum using Delphi 2 and 3 instruments, as well as qualitative methods, such as focus groups.
2. The curriculum needs to be mapped so that the balance of different types of teaching and learning and assessment strategies can be evaluated and monitored.
3. Continuous feedback needs to be sought on the curriculum and analysed, and modifications to the curriculum need to be made on the basis of the feedback and evaluated.
4. After development of new study units, the whole curriculum needs to be validated by the other important stakeholders: clients and students.

5. The new curriculum needs to be phased in (new units piloted with volunteers before implementing course wide) and evaluated.
6. The application of complex theory needs to be investigated in the further development and implementation of the curriculum. A starting point may be to identify the key messages of the community/public health curriculum.
7. The research could be expanded to involve other allied healthcare professions.

## CONCLUSION

The research emphasised the importance of the physiotherapy profession for improving the health status of the South African population through relevantly educated physiotherapy graduates who can take on appropriate professional roles through suitable educational standards.

I now regularly ask myself when I enter a classroom (at any level), ‘What can I learn today from this experience?’ And I ask of those I am privileged to teach, ‘Can you see another way to do/read/interpret what we have just done?’ Combined with my personal metaphysical views, also developed while I have been studying complexity theory, I now begin to envision education as:

A fascinating imaginative realm,  
Born of the echo of God’s laughter,  
Where no one owns the truth,  
And everyone has the right to be understood.

(Milan Kundera, 1988, in Doll and Trueit 2010)

## REFERENCES

Abdelkhalek, N., Hussein, A., Gibbs, T. & Hamdy, H. 2010. Using team-based learning to prepare medical students for future problem-based learning. *Medical Teacher*, 32(2),123-9.

Abdullah, S., Rahmat, R.A.A.O.K., Zaharim, A., Muhamad, N., Deros, B.M., Kofli, N.T., et al. 2009. Implementing continual review of programme educational objectives and outcomes for OBE curriculum based on stakeholders' input. *European Journal of Scientific Research*. 29,89-99.

Abowitz, D.A. & Toole, T.M. 2009. Mixed method research: Fundamental issues of design, validity, and reliability in construction research. *Journal of Construction Engineering and Management*, 136(1),108-16.

Accreditation Council for Canadian Physiotherapy Academic Programs, Canadian Alliance of Physiotherapy Regulators, Canadian Physiotherapy Association & Canadian Council of Physiotherapy University Programs. 2009. Essential competency profile for physiotherapists in Canada. Ottawa, Canada: Accreditation Council for Canadian Physiotherapy Academic Programs.

Achuthan, R., Grover, K. & MacFie, J. 2006. A critical evaluation of the electronic surgical logbook [Internet]. *BMC Medical Education*, 6(1),15. [<http://dx.doi.org/10.1186/1472-6920-6-15>]

Adam, K., Strong, J. & Chipchase, L. 2013. Preparing occupational therapy and physiotherapy students for work-related practice: A clinical education initiative at one Australian university [Internet]. *The Internet Journal of Allied Health Sciences and Practice*, 11(1),1-9, [cited 2012 Dec 17]. Available from: <http://0-ijahsp.nova.edu.innopac.up.ac.za/articles/Vol11Num1/pdf/Adam.pdf>

Adams, J., Witten, K. & Conway, K. 2009. Community development as health promotion: Evaluating a complex locality-based project in New Zealand. *Community Development Journal*, 44(2),140-57.

- Adcock, R. 2001. Measurement validity: A shared standard for qualitative and quantitative research. *American political science review*, 95(03),529-46.
- Aguilar, A., Stupans, L. & Scutter, S. 2011. Assessing students' professionalism: Considering professionalism's diverging definitions [Internet]. *Education for Health*, 24(3). [cited 2013 Jan 13]. Available from: <http://www.educationforhealth.net>
- Ahuja, D. 2011. Continuing professional development within physiotherapy: A special perspective. *Journal of Physical Therapy*, 3(1),4-8.
- Aitken, L., Elliott, D., McKinley, S., Alison, J., King, M., Leslie, G., et al. 2010. The effect of home based rehabilitation and other predictors on physical recovery in ICU survivors [Abstract]. *Australian Critical Care*, 23(1),32.
- Akdere, M. 2005. Appreciative inquiry: A field study of community development. *Systemic Practice and Action Research*, 18(1),21-34.
- Albanese, M.A., Mejicano, G., Mullan, P., Kokotailo, P. & Gruppen, L. 2008. Defining characteristics of educational competencies. *Medical Education*, 42(3),248-55.
- Alise, M.A. & Teddlie, C. 2010. A continuation of the paradigm wars? Prevalence rates of methodological approaches across the social/behavioral sciences. *Journal of Mixed Methods Research*, 4(2),103-26.
- Allender, J.A. & Spradley, B.W. 2005. *Community health nursing: Promoting and protecting the public's health*. Philadelphia: Lippincott Williams and Wilkins.
- Allan, C.M., Campbell, W.N., Guptill, C.A., Stephenson, F.F. & Campbell, K.E. 2006. A conceptual model for interprofessional education: The International Classification of Functioning, Disability and Health (ICF). *Journal of Interprofessional Care*, 20(3),235-45.
- Allan, J.D., Stanley, J., Crabtree, M.K., Werner, K.E. & Swenson, M. 2005. Clinical Prevention and Population Health Curriculum Framework: The nursing perspective. *Journal of Professional Nursing*, 21(5),259-67.

American Council for Graduate Medical Education Board. 2007. Common program requirements: General competencies. Washington, USA: American Council for Graduate Medical Education Board (ACGME).

Andre, K.N.V. & Barnes, L. 2010. Creating a 21<sup>st</sup> century nursing work force: Designing a Bachelor of Nursing program in response to the health reform agenda. Leadership for Learning Special Issue, Research and Innovation in International Nurse Education, 30(3),258-63.

Archer, J., Norcini, J., Southgate, L., Heard, S. & Davies, H. 2008. Mini-PAT (peer assessment tool): A valid component of a national assessment programme in the UK? Advances in Health Sciences Education, 13(2),181-92.

Australian Association of Social Workers [Internet]. 2003. Practice standards for social workers: Achieving outcomes. Canberra AASW. [updated 2013; cited 2012 Nov 15]. Available from: [http://www.aasw.asn.au/adobe/publications/Practice\\_Standards\\_Final\\_Oct\\_2003.pdf](http://www.aasw.asn.au/adobe/publications/Practice_Standards_Final_Oct_2003.pdf)

Australian Physiotherapy Council [Internet]. 2006. Australian standards for physiotherapy. [updated 2011; cited 2012 Jul 20]. Available from: [http://www.physiocouncil.com.au/australian\\_standards\\_for\\_physiotherapy](http://www.physiocouncil.com.au/australian_standards_for_physiotherapy)

Axelsson, R. & Axelsson, S.B. 2006. Integration and collaboration in public health: A conceptual framework. The International Journal of Health Planning and Management, 21(1),75-88.

Babbie, E. & Mouton, J. 2001. The practice of social research. Cape Town, RSA: Oxford University Press.

Badley, E.M. 2008. Enhancing the conceptual clarity of the activity and participation components of the International Classification of Functioning, Disability, and Health. Social Science and Medicine, 66(11),2 335-45.

- Baernstein, A., Oelschlager, A.E.A., Chang, T.A. & Wenrich, M.D. 2009. Learning professionalism: Perspectives of preclinical medical students. *Academic Medicine*, 84(5),574-81.
- Baglin, M. & Rugg, S. 2010. Student nurses' experiences of community-based practice placement learning: A qualitative exploration. *Nurse Education in Practice*, 10(3),144-52.
- Baig, L., Violato, C. & Crutcher, R. 2009. Assessing clinical communication skills in physicians: Are the skills context specific or generalizable. *BMC Medical Education*, 9(1),22.
- Baiocchi-Wagner, E.A. 2012. Framing the aging experience in care facility brochures: A mixed-method analysis. *Southern Communication Journal*, 77(4),349-68.
- Baker, E.A., Brownson, R.C., Dreisinger, M., McIntosh, L.D. & Karamelic-Muratovic, A. 2009. Examining the role of training in evidence-based public health: A qualitative study. *Health Promotion Practice*, 10(3),342-8.
- Bandiera, G., Sherbino, J. & Frank, J.R. 2006. *The CanMEDS assessment tools handbook: An introductory guide to assessment methods for the CanMEDS competencies*. 1<sup>st</sup> ed. Ottawa, Canada: The Royal College of Physicians and Surgeons of Canada.
- Barber, R., Boote, J.D. & Cooper, C.L. 2007. Involving consumers successfully in NHS research: A national survey. *Health Expectations*, 10(4),380-1.
- Barnett, A., Smith, B., Lord, S.R., Williams, M. & Baumand, A. 2003. Community-based group exercise improves balance and reduces falls in at-risk older people: A randomised controlled trial. *Age and Ageing*, 32(4),407-14.
- Barnidge, E.K., Radvanyi, C., Duggan, K., Motton, F., Wiggs, I., Baker, E.A., et al. 2013. Understanding and addressing barriers to implementation of environmental and policy interventions to support physical activity and healthy eating in rural communities. *The Journal of Rural Health*, 29(1),97-105.
- Barnsteiner, J.H., Disch, J.M., Hall, L., Mayer, D. & Moore, S.M. 2007. Promoting interprofessional education. *Nursing Outlook*, 55(3),144-50.



- Barrett, C. & Smerdely, P. 2002. A comparison of community-based resistance exercise and flexibility exercise for seniors. *Australian Journal of Physiotherapy*, 48(3),215-20.
- Barron, P. & Pillay, Y. 2011. *The implementation of PHC re-engineering in South Africa*. Cape Town, RSA: Public Health Association of South Africa.
- Barrow, M., McKimm, J. & Samarasekera, D.D. 2011. Strategies for planning and designing medical curricula and clinical teaching. *South-East Asian Journal of Medical Education*, 4(1),2-8.
- Barry, M.M., Allegrante, J.P., Lamarre, M., Auld, M.E. & Taub, A. 2009. The Galway Consensus conference: International collaboration on the development of core competencies for health promotion and health education. *Global Health Promotion*, 16(2),5-11.
- Bartee, R.T., Winnail, S.D., Olsen, S.E., Diaz, C. & Blevens, J.A. 2003. Assessing competencies of the public health workforce in a frontier state. *Journal of Community Health*, 28(6),459-69.
- Baruch, Y. & Holtom, B.C. 2008. Survey response rate levels and trends in organizational research. *Human Relations*, 61(8),1139-60.
- Bassett, S.F. & Prapavessis, H. 2009. Home-based versus clinic-based physiotherapy for acute ankle sprains [Abstract]. *Journal of Orthopaedic and Sports Physical Therapy*, 39(10),A20.
- Basu, S. & Roberts, C. 2012. Towards a public health curriculum in undergraduate medicine. *Education for Health*, 25(2),98-104.
- Battat, R., Seidman, G., Chadi, N., Chanda, M., Nehme, J., Hulme, J., et al. 2010. Global health competencies and approaches in medical education: A literature review [Internet]. *BMC Medical Education*, 10(1),94-101. [<http://dx.doi.org/10.1186/1472-6920-10-94>]
- Bawden, J.W. 2007. Fluoride varnish: A useful new tool for public health dentistry. *Journal of Public Health Dentistry*, 58(4),266-9.

- Baxter, P. & Jack, S. 2008. Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4),544-59.
- Bazeley, P. 2009. Integrating data analyses in mixed methods research. [Editorial]. *Journal of Mixed Methods Research*, 3(3),203-7.
- Beach, M.C., Price, E.G., Gary, T.L., Robinson, K.A., Gozu, A., Palacio, A., et al. 2005. Cultural competency: A systematic review of health care provider educational interventions. *Medical Care*, 43(4),356-73.
- Beaglehole, R., Bonita, R., Horton, R., Adams, C., Alleyne, G., Asaria, P., et al. 2011. Priority actions for the non-communicable disease crisis. *The Lancet*, 377(9775),1438-47.
- Beech, R., Rudd, A.G., Tilling, K. & Wolfe, C.D. 1999. Economic consequences of early inpatient discharge to community-based rehabilitation for stroke in an inner-London teaching hospital. *Stroke*, 30(4),729-35.
- Begley, K., Haddad, A.R., Christensen, C. & Lust, E. 2009. A health education program for underserved community youth led by health professions students. *American Journal of Pharmaceutical Education*, 73(6),1-7.
- Bell, S.K., Wideroff, M. & Gaufberg, L. 2010. Student voices in Readers' Theater: Exploring communication in the hidden curriculum. *Miami Special Issue: AACH Conference 2009, Miami, USA.*, 80(3),354-57.
- Bender, C.J.H., Daniels, P., Lazarus, J., Naude, L. & Sattar, K. 2006. *Service-learning in the curriculum: A resource for higher education institutions*. Pretoria, Republic of South Africa: Council on Higher Education.
- Bentley, P., Jovanovic, A. & Sharma, P. 2008. Cultural diversity training for UK healthcare professionals: A comprehensive nationwide cross-sectional survey. *Clinical Medicine*, 8(5),493-7.
- Bergman, M.M. 2010. On concepts and paradigms in mixed methods research. *Journal of Mixed Methods Research*, 4(3),171-5.

Bergman, M.M. 2011. The good, the bad, and the ugly in mixed methods research and design. *Journal of Mixed Methods Research*, 5(4),271-5.

Betancourt, J.R. 2006. Cultural competence and medical education: Many names, many perspectives, one goal. *Academic Medicine*, 81(6),499-501.

Betancourt, J.R., Green, A.R. & Carrillo, J.E. 2002. Cultural competence in health care: Emerging frameworks and practical approaches. United Nations, Geneva: Commonwealth Fund, Quality of Care for Underserved Populations.

Bhattacharyya, J. 2004. Theorizing community development. *Community Development Society Journal*, 34(2),5-34.

Bhutta, Z.A., Chen, L., Cohen, J., Crisp, N., Evans, T., Fineberg, H., et al. 2010. Education of health professionals for the 21<sup>st</sup> century: A global independent commission. *The Lancet*, 375(9721),1137-8.

Bialocerkowski, A., Wells, C. & Grimmer-Somers, K. 2011. Teaching physiotherapy skills in culturally-diverse classes [Internet]. *BMC Medical Education*, 11(2011),34. [cited 2012 Feb 17]. Available from: <http://www.biomedcentral.com/1472-6920/11/34>

Bic, Z. 2012. Introduction to public health. Coursera notes [Internet]. Baltimore, MD: John Hopkins University. [cited 2012 Feb 01]. Available from: <https://www.coursera.org>.

Biesta, G. 2010. Pragmatism and the philosophical foundations of mixed methods research. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage. 95-117 p.

Bitsch, V. 2005. Qualitative research: A grounded theory example and evaluation criteria. *Journal of Agribusiness*, 23(1),75-91.

Bleakley, A. 2011. Professing medical identities in the liquid world of teams. *Medical Education*, 45(12),1171-3.

- Bleakley, A., Marshall, R. & Brömer, R. 2006. Toward an aesthetic medicine: Developing a core medical humanities undergraduate curriculum. *Journal of Medical Humanities*, 27(4),197-213.
- Bligh, J., Prideaux, D. & Parsell, G. 2001. PRISMS: New educational strategies for medical education [Editorial]. *Medical Education*, 35(2001),520-1.
- Blue, A.V., Barnette, J.J., Ferguson, K.J. & Garr, D.R. 2000. Evaluation methods for prevention education. *Academic Medicine*, 75(7 Suppl),S28-34.
- Boddy, C. 2005. A rose by any other name may smell as sweet but “group discussion” is not another name for a “focus group” nor should it be. *Qualitative Market Research*, 8(3),248-55.
- Boissonnault, W., Morgan, B. & Buelow, J. 2006. A comparison of two strategies for teaching medical screening and patient referral in a physical therapist professional degree program. *Journal of Physical Therapy Education*, 20(1),28-36.
- Börkan, B. 2010. The mode effect in mixed-mode surveys: Mail and web surveys. *Social Science Computer Review*, 28(3),371-80.
- Boutin-Foster, C., Foster, J.C. & Konopasek, L. 2008. Physician, know thyself: The professional culture of medicine as a framework for teaching cultural competence. *Academic Medicine*, 83(1),106-11.
- Bowe, C.M.A., Voss, J. & Thomas Aretz, H. 2009. Case method teaching: An effective approach to integrate the basic and clinical sciences in the preclinical medical curriculum. *Medical Teacher*, 31(9),834-41.
- Bowen, G.A. 2009. Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2),27-40.
- Brach, J.S., Fitzgerald, S., Newman, A.B., Kelsey, S., Kuller, L., van Swearingen, J.M., et al. 2003. Physical activity and functional status in community-dwelling older women: A 14-year prospective study. *Archives of Internal Medicine*, 163(21),2565-71.

- Bren, T. 2005. Transcultural competence in health care practice: The development of shared resources for practitioners. *Practice*, 17(4),257-66.
- Bringler, R.G. & Hatcher, J.A. 1995. The service-learning curriculum for faculty. *Michigan Journal of Community Service Learning*, 45(4),112-22.
- Bringler, R.G. & Hatcher, J.A. 2009. Innovative practices in service-learning and curricular engagement. *New Directions for Higher Education*, 2009(147),37-46.
- Broberg, C., Aars, M., Beckmann, K., Emaus, N., Lehto, P., Lähteenmäki, M., et al. 2003. A conceptual framework for curriculum design in physiotherapy education: An international perspective. *Advances in Physiotherapy*, 5(4),161-8.
- Brodie, P. & Irving, K. 2006. Assessment in work-based learning: Investigating a pedagogical approach to enhance student learning. *Assessment and Evaluation in Higher Education*, 32(1),11-9.
- Brown, J.P. 2007. A new curriculum framework for clinical prevention and population health, with a review of clinical caries prevention teaching in U.S. and Canadian dental schools. *Journal of Dental Education*, 71(5),572-8.
- Brown, L.M. 1994. Standing in the crossfire: A response to Tavis, Gremmen, Lykes, Davis, and Contratto. *Feminism and Psychology*, 4(3),382-98.
- Browning, D.M., Meyer, E.C., Truog, R.D. & Solomon, M.Z. 2007. Difficult conversations in health care: Cultivating relational learning to address the hidden curriculum. *Academic Medicine*, [Internet] 82(9),905-13 [<http://dx.doi.org/10.1097/ACM.0b013e31812f77b9>]
- Brownson, R.C., Baker, E.A., Leet, T.L. & Gillespie, K.N. 2003. Evidence-based public health. New York: Oxford University Press. In: Baker, E.A., Brownson, R.C., Dreisinger M., McIntosh L.D. and Karamelic-Muratovic In A. 2009. Examining the role of training in evidence-based public health: A qualitative study. *Health Promotion and Practice*,10,342.

- Brownson, R.C., Fielding, J.E. & Maylahn, C.M. 2009. Evidence-based public health: A fundamental concept for public health practice. *Annual Review of Public Health*, 30(Jan),175-201.
- Brownson, R.C., Gurney, J.G. & Land, G.H. 1999. Evidence-based decision making in public health. *Journal of Public Health Management and Practice*, 5,86-97.
- Brownson, R.C., Kelly, C.M., Eyler, A.A., Carnoske, C., Grost, L., Handy, S.L., et al. 2008. Environmental and policy approaches for promoting physical activity in the United States: A research agenda. *Journal of Physical Activity and Health*, 5(4),488-503.
- Brownson, R.C., Kreuter, M.W., Arrington, B.A. & True, W.R. 2006. Translating scientific discoveries into public health action: How can schools of public health move us forward? *Public Health Report*, 121 (1),97–103.
- Bryman, A. 2006. Integrating quantitative and qualitative research: How is it done? *Qualitative research*, 6(1),97-113.
- Bryman, A. 2007. Barriers to integrating quantitative and qualitative research. *Journal of Mixed Methods Research*, 1(1),8-22.
- Bryman, A., Becker, S. & Sempik, J. 2008. Quality criteria for quantitative, qualitative and mixed methods research: A view from social policy. *International Journal of Social Research Methodology*, 11(4),261-76.
- Buckley, S., Coleman, J., Davison, I., Khan, K.S., Zamora, J., Malick, S., et al. 2009. The educational effects of portfolios on undergraduate student learning: A Best Evidence Medical Education (BEME) systematic review. BEME Guide No. 11. *Medical Teacher*, 31(4),282-98.
- Buckner, A.V., Ndjakani, Y.D., Banks, B. & Blumenthal, D.S. 2010. Using service-learning to teach community health: The Morehouse School of Medicine Community Health course. *Academic Medicine*, 85(10),1645-51.

- Bulger, S.M. & Housner, L.D. 2007. Modified Delphi investigation of exercise science in physical education teacher education. *Journal of Teaching in Physical Education*, 26(n.d),57-80.
- Bundred, P.E. & Levitt, C. 2000. Medical migration: Who are the real losers? *The Lancet*, 356(9225),245-6.
- Burch, V.C. 2007. Medical education in South Africa: Assessment practices in a developing country. Chap. 2. [thesis]. Rotterdam: Erasmus University, [cited 2012 Jun 19]. Available from: <http://repub.eur.nl/res/pub/10152/>
- Burch, S., Longbottom, J., McKay, M. & Prevost, T. 1999. A randomized controlled trial of day hospital and day centre therapy. *Clinical Rehabilitation*, 13(2),105-12.
- Burch, V.C. & Seggie, J.L. 2008. Use of a structured interview to assess portfolio-based learning. *Medical Education*, 42(9),894-900.
- Burch, V.C., McKinley, D., van Wyk, J., Kiguli-Walube, S., Cameron, D., Cilliers, F.J., et al. 2011. Career intentions of medical students trained in six sub-Saharan African countries [Internet]. *Education for Health*, 24(3),614. [cited 2012 Nov 07]. Available from: <http://www.educationforhealth.net/>
- Burns, N. & Grove, S.K. 2007. *Understanding nursing research: Building an evidence-based practice*. 4<sup>th</sup> ed. St. Louis, MO: Saunders Elsevier.
- Burns, N., Grove, S.K. & Gray, J. 2011. *Understanding nursing research: Building an evidence-based practice*. 5<sup>th</sup> ed. Maryland Heights, MO: Saunders Elsevier.
- Bury, T. 2005. Primary health care and community based rehabilitation: Implications for physical therapy. *Asia Pacific Disability Rehabilitation Journal*, 16(2),29-61.
- Bushe, G.R. & Kassam, A.F. 2005. When is appreciative inquiry transformational? A meta-case analysis. *The Journal of Behavioral Science*, 40(2),161-81.

- Byrne, S., Wake, M., Blumberg, D. & Dibley, M. 2008. Identifying priority areas for longitudinal research in childhood obesity: Delphi technique survey. *International Journal of Pediatric Obesity*, 3(2),120-2.
- Byszewski, A., Hendelman, W., McGuinty, C. & Moineau, G. 2012. Wanted: Role models- medical students' perceptions of professionalism [Internet]. *BMC Medical Education*, 12(1),115. [<http://dx.doi.org/10.1186/1472-6920-12-115>]
- Calhoun, J., Ramiah, K., Weist, E. & Shortell, S. 2008. Development of a core competency model for the master of public health degree. *American Journal of Public Health*, 98(9),1598-607.
- Campbell, S.L., Fowles, E.R. & Weber, B.J. 2004. Organizational structure and job satisfaction in public health nursing. *Public Health Nursing*, 21(6),564-71.
- Campinha-Bacote, J. 2002. The process of cultural competence in the delivery of healthcare services: A model of care. *Journal of Transcultural Nursing*, 13(3),181-4.
- Canadian Association of Occupational Therapists. 2007. Profile of occupational therapy practice in Canada. Ottawa, Canada: Canadian Association of Occupational Therapists.
- Caraher, M. & Cowburn, G. 2005. Taxing food: Implications for public health nutrition. *Public Health Nutrition*, 8(08),1242-9.
- Carey, T.S. & Roper, W.L. 2004. Clinical prevention and population health: Getting there from here. *American Journal of Preventive Medicine*, 27(5),480-1.
- Carroll, T.L. 2005. Leadership skills and attributes of women and nurse executives: Challenges for the 21<sup>st</sup> century. *Nursing Administration Quarterly*, 29(2),146-53.
- Carter, C., Ruhe, M., Weyer, S., Litaker, D., Fry, R. & Stange, K. 2007. An appreciative inquiry approach to practice improvement and transformative change in health care settings. *Quality Management in Health Care*, 16(3),194–204.
- Cashman, S.B. & Seifer, S.D. 2008. Service-learning: An integral part of undergraduate public health. *American Journal of Preventive Medicine*, 35(3),273-78.



Cassidy, J.D. & Cote, P. 2008. Is it time for a population health approach to neck pain? *Journal of Manipulative and Physiological Therapeutics*, 31(6),442-6.

Castro, F.G., Kellison, J.G., Boyd, S.J. & Kopak, A. 2010. A methodology for conducting integrative mixed methods research and data analyses. *Journal of Mixed Methods Research*, 4(4),342-60.

Cegielski, C.G. 2008. Toward the development of an interdisciplinary information assurance curriculum: Knowledge domains and skill sets required of information assurance professionals decision sciences. *Journal of Innovative Education*, 6(1),29-49.

Chambers, R. 1998. Beyond “Whose reality counts?” New methods we now need? *Studies in Cultures, Organizations and Societies*, 4(2),279-301.

Chartered Society of Physiotherapy c.2012. *Physiotherapy framework*. London: Chartered Society of Physiotherapy.

Chastonay, P., Vu, N.V., Humair, J.P., Mpinga, E.K. & Bernheim, L. 2012. Design, implementation and evaluation of a community health training program in an integrated problem-based medical curriculum: A fifteen-year experience at the University of Geneva Faculty of Medicine [Internet]. *Medical Education Online*, 17. [cited 2012 Dec 20]. Available from: <http://0-www.ncbi.nlm.nih.gov.innopac.up.ac.za/pmc/articles/PMC3387672/pdf/MEO-17-16741.pdf>

Cheng, H., Guo, F., Hsu, T., Chuang, S., Yen, H., Lee, F., et al. 2012. Two strategies to intensify evidence-based medicine education of undergraduate students: A randomised controlled trial. *Annals of Academic Medicine of Singapore*, 41(1),4-11.

Chipchase, L., Williams, M. & Robertson, V. 2010. Generic attributes in physiotherapy education. *Focus on Health Professional Education*, 12(1),74-85.

Chiseri-Strater, E. 1996. Turning in upon ourselves: Positionality, subjectivity, and reflexivity in case study and ethnographic research. In Mortensen, P. and Kirsch, G.E. *Ethics and responsibility in qualitative studies of literacy*. Urbana, IL: NCTE. 115–133 p. In Pillow, W. 2003. *Confession, catharsis, or cure? Rethinking the uses of reflexivity as methodological*

power in qualitative research. *International Journal of Qualitative Studies in Education*, 16(2),175-96.

Chou, S., Cole, G., McLaughlin, K. & Lockyer, J. 2008. CanMEDS evaluation in Canadian postgraduate training programmes: Tools used and programme director satisfaction. *Medical Education*, 42(9),879-86.

Christians, C.G. 2005. Ethics and politics in qualitative research. In Denzin N.K. and Lincoln A.E. eds. *Sage handbook of qualitative research*. Thousand Oaks, CA: Sage. 139-64 p.

Ciaschini, P.M., Straus, S.E., Dolovich, L.R., Goeree, R.A., Leung, K.M., Woods, C.R., et al. 2009. Community-based intervention to optimise falls risk management: A randomised controlled trial. *Age and Ageing*, 38(6),724-30.

Cibula, D.A., Novick, L.F., Morrow, C.B. & Sutphen, S.M. 2003. Community health assessment. *American Journal of Preventive Medicine*, 24(4, Suppl),S118-23.

Cieza, A. & Stucki, G. 2008. The International Classification of Functioning Disability and Health: Its development process and content validity. *European Journal of Physical Rehabilitation and Medicine*, 44(3),303-13.

Cioffi, J. 2005. Nurses' experiences of caring for culturally diverse patients in an acute care setting. *Contemporary Nurse*, 20(1),78-86.

Clark, M.J.D. 2008. *Community health nursing: Advocacy for population health*. 5th ed. Upper Saddle River, NJ: Pearson Prentice Hall.

Clarke, H., Egan, B., Fletcher, L. & Ryan, C. 2006. Creating case studies of practice through appreciative inquiry. *Educational Action Research*, 14(3),407-22.

Clouder, L. & Toms, J. 2008. Impact of oral assessment on physiotherapy students' learning in practice. *Physiotherapy Theory and Practice*, 24(1),29-42.

Collins Concise Dictionary. 21<sup>st</sup> Century 2001. Glasgow, Great Britain: HarperCollins.

Collins, K.M.T., Onwuegbuzie, A.J. & Sutton, I.L. 2006. A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond. *Learning Disabilities: A Contemporary Journal*, 4(1),67-100.

Community Media Trust 2011. Provincial guidelines for the implementation of the three streams of PHC re-engineering. South Africa: Community Media Trust.

Cook, D.A., Levinson, A.J., Garside, S., Dupras, D.M., Erwin, P.J. & Montori, V.M. 2008. Internet-based learning in the health professions: A meta-analysis [Internet]. *JAMA*, 300(10),1. [<http://dx.doi.org/10.1001/jama.300.10.1181>]

Cooperrider, D.L. 2003. Resources for getting appreciative inquiry started: An example. In Cooperrider D.L., Whitney D. and Stavros J.M. eds. *Appreciative inquiry handbook*. Bedford Heights, OH: Lakeshore. 1-5 p.

Cooperrider, D.L. & Whitney, D.K. 1999. *Appreciative inquiry: A positive revolution in change*. San Francisco, CA: Berrett-Koehler.

Cooperrider, D.L. & Whitney, D.K. 2005. *Appreciative inquiry: A positive revolution in change*. 2<sup>nd</sup> ed. San Francisco, CA: Berrett-Koehler.

Cooperrider, D.L., Whitney, D. & Stavros, J.M. 2003. *Appreciative inquiry handbook*. Bedford Heights, OH: Lakeshore.

Coovadia, H., Jewkes, R., Barron, P., Sanders, D. & McIntyre, D. 2009. The health and health system of South Africa: Historical roots of current public health challenges. *The Lancet*, 374(9692),817-34.

Cornick, P. 2006. Nitric oxide education survey: Use of a Delphi survey to produce guidelines for training neonatal nurses to work with inhaled nitric oxide. *Journal of Neonatal Nursing*, 12(2),62-8.

Couper, I. 2002. Culture shock among new doctors. *South African Family Practice*, 25(1),17-8.

Cowley, J.C.P. 2000. Strategic qualitative focus group research: Define and articulate our skills or we will be replaced by others. 42(1),17-38. In Boddy, C. 2005. A rose by any other name may smell as sweet but “group discussion” is not another name for a “focus group” nor should it be. *Qualitative Market Research*, 8(3),248-55.

Craven, M. 1967. I heard the owl call my name. Canada: Clarke Irwin and Co.

Creswell, J.W. 2009. *Research design: Qualitative, quantitative and mixed methods approaches*. 3<sup>rd</sup> ed. Thousand Oaks, CA: Sage.

Creswell, J.W., Fetters, M.D. & Ivankova, N.V. 2004. Designing a mixed methods study in primary care. *The Annals of Family Medicine*, 2(1),7-12.

Creswell, J.W. & Plano Clark, V.L. 2007. *Designing and conducting mixed methods research*. London: Sage.

Creswell, J.W. & Plano Clark, V.L. 2011. *Designing and conducting mixed methods research*. 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage.

Cross, D., Walsh Brennan, A.M., Cotter, V.T. & Watts, R.J. 2008. Cultural competence in the Master's curriculum: A course exemplar. *Journal of Professional Nursing*, 24(3),150-4.

Cross, V., Hicks, C. & Barwell, F. 2001. Comparing the importance of clinical competence criteria across specialties: Impact on undergraduate assessment. *Physiotherapy*, 87(7),351-67.

Cruess, R., McIlroy, J.H., Cruess, S., Ginsburg, S. & Steinert, Y. 2006. The professionalism mini-evaluation exercise: A preliminary investigation. *Academic Medicine*, 81(10 Suppl),S74-8.

Currie, C.T. & Hutchison, J.D. 2005. Audit, guidelines and standards: Clinical governance for hip fracture care in Scotland. *Disability & Rehabilitation*, 27(18/19),1099-105.

Dalley, K., Candela, L. & Benzel-Lindley, J. 2008. Learning to let go: The challenge of de-crowding the curriculum. *Nurse Education Today*, 28(1),62-9.

- Darrah, J., Loomis, J., Manns, P., Norton, B. & May, L. 2006. Role of conceptual models in a physical therapy curriculum: Application of an integrated model of theory, research, and clinical practice. *Physiotherapy Theory and Practice*, 22(5),239-50.
- Das, R. 2005. Internationalisation of the curriculum: Putting theory into practice in a physiotherapy program. *Journal of University Teaching and Learning Practice*, 2(1),3 screens.
- Davenport, N.C., Spath, M.L. & Blauvelt, M.J. 2009. A step-by-step approach to curriculum review. *Nurse educator*, 34(4),181-5.
- Davies, K., Harrison, K., Clouder, D., Gilchrist, M., McFarland, L. & Earland, J. 2011. Making the transition from physiotherapy student to interprofessional team member. *Physiotherapy*, 97(2),139-44.
- Davis, D.A., Mazmanian, P.E., Fordis, M., van Harrison, R., Thorpe, K.E. & Perrier, L. 2006. Accuracy of physician self-assessment compared with observed measures of competence: A systematic review. *JAMA*, 296(9),1094-102.
- Day, J. & Bobeva, M. 2005. A generic toolkit for the successful management of Delphi studies. *The Electronic Journal of Business Research Methodology*, 3(2),103-16.
- De Palma, J.A. 2011. Searchable questions for evidence-based practice. *Home Health Care Management and Practice*, 23(1),52-4.
- de Villiers, M.R., de Villiers, P.J.T. & Kent, A.P. 2005. The Delphi technique in health sciences education research. *Medical Teacher*, 27(7),639-43.
- Dean, E. 2007. The first physical therapy summit on global health. Paper presented at World Confederation of Physical Therapy Conference. Vancouver, Canada. 2-6 June 2007.
- Dean, E. 2009a. Physical therapy in the 21<sup>st</sup> century (Part I): Toward practice informed by epidemiology and the crisis of lifestyle conditions. *Physiotherapy Theory and Practice*, 25(5-6),330-53.

Dean, E. 2009b. Physical therapy in the 21<sup>st</sup> century (Part II): Evidence-based practice within the context of evidence-informed practice. *Physiotherapy Theory and Practice*, 25(5-6),354-68.

Dean, E., Dornelas de Andrade, A., O'Donoghue, G., Skinner, M., Umereh, G., Beenen, P. et al. 2013. The Second Physical Therapy Summit on Global Health: Developing an action plan to promote health in daily practice and reduce the burden of noncommunicable diseases. *Physical Therapy Theory and Practice*. Forthcoming.

Delany, C. & Watkin, D. 2009. A study of critical reflection in health professional education: "Learning where others are coming from." *Advances in Health Sciences Education*, 14(3),411-29.

De Haan, M. 2005. *The health of Southern Africa* Cape Town, RSA: Juta

Dellinger, A.B. & Leech, N.L. 2007. Toward a unified validation framework in mixed methods research. *Journal of Mixed Methods Research*, 1(4),309-32.

Dent, J.A. & Harden, R.M. 2009. *A practical guide for medical teachers*. 3rd ed. Edinburgh: Churchill Livingstone/Elsevier.

Democracy and Governance Human Science Research Council (HSRC) 2005. *Overcoming the legacy of discrimination in South Africa: Report to the Presidency*, South Africa. Pretoria, RSA: The Presidency.

Denscombe, M. 2008. Communities of practice: A research paradigm for the mixed methods approach. *Journal of Mixed Methods Research*, 2(3),270-83.

Denzin, N.K. 2009. Strategies of multiple triangulation. In Denzin, N.K. *The research act: A theoretical introduction to sociological methods*. Chicago: Aldine De Gruyter. 297-331 p. In Ammenwerth, E., Iller, C. & Mansmann, U. 2003. Can evaluation studies benefit from triangulation? A case study. *International Journal of Medical Informatics*, 70(2-3),237-48. 297-331

Denzin, N.K. 2012. Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2),80-8.

Denzin, N.K. & Lincoln, Y.S. 2005. The Sage handbook of qualitative research. 3<sup>rd</sup> ed. Thousand Oaks, CA: Sage.

Department of Physiotherapy University of Pretoria. 2000 - 2008. Departmental staff and strategic planning minutes, Department of Physiotherapy, University of Pretoria.

Department of Physiotherapy University of Pretoria. 2012. Professional development and community physiotherapy to be introduced in FTP100. Unpublished minutes: Department of Physiotherapy, University of Pretoria.

Deutskens, E., de Ruyter, K., Wetzels, M. & Oosterveld, P. 2004. Response rate and response quality of internet-based surveys: An experimental study. *Marketing Letters*, 15(1),21-36.

Dewey, J. 1916. *Democracy and education: An introduction to philosophy of education*. New York: Macmillan.

Dharamsi, S., Ho, A., Spadafora, S.M. & Woollard, R. 2011. The physician as health advocate: Translating the quest for social responsibility into medical education and practice. *Academic Medicine*, 86(9),1108-13.

DiCicco-Bloom, B. & Crabtree, B.F. 2006. The qualitative research interview. *Medical Education*, 40(4),314-21.

Diggins, J. 1994. The promise of pragmatism. In Denzin N.K. and Lincoln A.E. eds. *The Sage handbook of qualitative research*. Thousand Oaks, CA: Sage.

Dijken, P.C.V.A., Thévoz, S., Jucker-Kupper, P., Feihl, F.Ç., Bonvin, R. & Waeber, B. 2008. Evaluation of an online, case-based interactive approach to teaching pathophysiology. *Medical Teacher*, 30(5),131-6.

Dijkers, M.P., Murphy, S.L. & Krellman, J. 2012. Evidence-based practice for rehabilitation professionals: Concepts and controversies. *Archives of Physical Medicine and Rehabilitation*, 93(8, Suppl),S164-76.

- Dionne, C.E., Dunn, K.M., Croft, P.R., Nachemson, A.L., Buchbinder, R., Walker, B.F., et al. 2008. A consensus approach toward the standardization of back pain definitions for use in prevalence studies. *Spine*, 33(1),95-103.
- Dobrow, M.J., Goel, V. & Upshur, R. 2004. Evidence-based health policy: Context and utilisation. *Social Science and Medicine*, 58(1),207-18.
- Doll, W.E. 1993. *A post-modern perspective on curriculum*. New York: Teachers College Press.
- Doll, W.E. 2008. Complexity and the culture of curriculum. *Educational Philosophy and Theory*, 40(1),190-212.
- Doll, W.E. & Trueit, D. 2010. Complexity and the health care professions. *Journal of Evaluation in Clinical Practice*, 16(4),841-8.
- Donaghy, M. & Morss, K. 2007. An evaluation of a framework for facilitating and assessing physiotherapy students' reflection on practice. *Physiotherapy Theory & Practice*, 23(2),83-94.
- Donaghy, M.E. & Morss, K. 2000. Guided reflection: A framework to facilitate and assess reflective practice within the discipline of physiotherapy. *Physiotherapy Theory and Practice*, 16(1),3-14.
- Donato, E.B., DuVall, R.E., Godges, J.J., Zimmerman, G.J. & Greathouse, D.G. 2004. Practice analysis: Defining the clinical practice of primary contact physical therapy. *Journal of Orthopaedic and Sports Physical Therapy*, 34(6),284-304.
- Dornan, T., Littlewood, S., Margolis, S.A., Scherpbier, A., Spencer, J. & Ypinazar, V. 2006. How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Medical Teacher*, 28(1),3-18.
- Downie, J., Ogilvie, S. & Wichmann, H. 2005. A collaborative model of community health nursing practice. *Contemporary Nurse: A Journal for the Australian Nursing Profession*, 20(2),180-92.



Downing, S. & Yudkowsky, R. eds. 2009. Assessment in health professions education. New York, NY: Routledge.

Drain, P., Primack, A., Hunt, D., Fawzi, W., Holmes, K. & Gardner, P. 2007. Global health in medical education: A call for more training and opportunities. *Academic Medicine*, 82(3),226-30.

Drenkard, K. & Swartwout, E. 2011. Introduction to positive practice environments and outcomes: State of the science - a commitment to optimal practice environments. *Journal of Nursing Administration*, 41(7-8 Suppl),S2-3.

Dreyer, J.S. 2010. Assessing professionalism in surgeons. *The Surgeon*, 8(1),20-7.

Dreyfus, S.E. 2004. The five-stage model of adult skill acquisition. *Bulletin of Science, Technology and Society*, 24(3),177-81.

Dufour, S.P. 2011. Understanding the roles of physiotherapists within Ontario primary health care teams: A mixed methods inquiry [thesis]. Ontario: The University of Western Ontario.

Durham, J., Tan, B.-K. & White, R. 2011. Utilizing mixed research methods to develop a quantitative assessment tool: An example from explosive remnants of a war clearance program. *Journal of Mixed Methods Research*, 5(3),212-26.

Dussault, G. & Dubois, C. 2003. Human resources for health policies: A critical component in health policies [Internet]. *Human Resources for Health*, 1(1),1. [http://dx.doi.org/10.1186/1478-4491-1-1]

Dussault, G. & Franceschini, M. 2006. Not enough there, too many here: Understanding geographical imbalances in the distribution of the health workforce [Internet]. *Human Resources for Health*, 4(1),12. [cited 2012 Nov 15]. Available from: <http://www.human-resources-health.com/content/4/1/12>

Dyrbye, L. & Shanafelt, T. 2012. Nurturing resiliency in medical trainees. *Medical Education*, 46(4),343-4.

- Earnest, M.A., Wong, S.L. & Federico, S.G. 2010. Physician advocacy: What is it and how do we do it? *Academic Medicine*, 85(1),63-7.
- Edwards, I. & Richardson, B. 2008. Clinical reasoning and population health: Decision making for an emerging paradigm of health care. *Physiotherapy Theory and Practice*, 24(3),183-93.
- Efstathiou, N., Ameen, J. & Coll, A. 2008. A Delphi study to identify healthcare users' priorities for cancer care in Greece. *European Journal of Oncology Nursing*, 12(4),362-71.
- Ehlers, V. ed. 2002. *Teaching aspects of health care*. Lansdowne, RSA: Juta.
- Elo, S. & Kynga, H. 2008. The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1),107-15.
- Engebretson, J., Mahoney, J. & Carlson, E.D. 2008. Cultural competence in the era of evidence-based practice. *Journal of Professional Nursing*, 24(3),172-8.
- Engels, T.C.E. & Powell Kennedy, H. 2007. Enhancing a Delphi study on family-focused prevention. *Technological Forecasting and Social Change*, 74(4),433-51.
- Entwistle, N. 2009. *Teaching for understanding at university: Deep approaches and distinctive ways of thinking*. Basingstoke: Palgrave: Macmillan. In: Thistlethwaite, J.E., Davies, D., Ekeocha, S., Kidd, J.M., MacDougall, C., Matthews, P., et al. 2012. The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME Guide No. 23. *Medical Teacher*, 34(6),421-44.
- Epling, J.W., Morrow, C.B., Sutphen, S.M. & Novick, L.F. 2003. Case-based teaching in preventive medicine: Rationale, development, and implementation. *American Journal of Preventive Medicine*, 24(4, Suppl),S85-9.
- Epstein, R.M. 2007. Assessment in medical education. *New England Journal of Medicine*, 356(4),387-96.
- Epstein, R.M. & Hundert, E.M. 2002. Defining and assessing professional competence. *JAMA*, 287(2),226-35.

- Evans, B.C., Coon, D.W. & Ume, E. 2011. Use of theoretical frameworks as a pragmatic guide for mixed methods studies: A methodological necessity? *Journal of Mixed Methods Research*, 5(4),276-92.
- Eyler, J. 2002. Reflecting on service: Helping nursing students get the most from service-learning. *Journal of Nursing Education*, 41(10),453-6.
- Eyler, J. & Giles, D.E. 1999. *Where is the service in service-learning?* San Francisco: Jossey-Bass.
- Eysenbach, G. 2004. Improving the quality of Web surveys: The Checklist for Reporting Results of Internet E-Surveys (CHERRIES). *Journal of Medical Internet Research*, 6(3),e34. [<http://dx.doi.org/10.2196/jmir.6.3.e34>]
- Faarvang, K.L. & da Silva, J.A. 2009. Competencies in rheumatology: A European framework. *Practical Competencies in Rheumatology*, 23(2),145-60.
- Faculty of Health Sciences. c 2012. *Guidelines for the submission of theses and dissertations. Supplement 5.* University of Pretoria: Faculty of Health Sciences.
- Farrell, M., Wallis, N.C. & Evans, M.T. 2007. A replication study of priorities and attitudes of two nursing programs' communities of interest: An appreciative inquiry. *Journal of Professional Nursing*, 23(5),267-77.
- Feilzer, M.Y. 2010. Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research*, 4(1),6-16.
- Feldstein, D., Maenner, M., Srisurichan, R., Roach, M. & Vogelmann, B. 2010. Evidence-based medicine training during residency: A randomized controlled trial of efficacy [Internet]. *BMC Medical Education*, 10,59. [<http://dx.doi.org/10.1186/1472-6920-10-59>]
- Feng, R.-F. & Tsai, Y.-F. 2012. Socialisation of new graduate nurses to practising nurses. *Journal of Clinical Nursing*, 21(13),2064-71.

- Fereday, J. & Muir-Cochrane, E. 2006. The role of performance feedback in the self-assessment of competence: A research study with nursing clinicians. *Collegian*, 13(1),10-5.
- Ferguson, F.C., Brownlee, M. & Webster, V. 2008. A Delphi study investigating consensus among expert physiotherapists in relation to the management of low back pain. *Musculoskeletal Care*, 6(4),197-210.
- Fields, S.K., Mahan, P., Tillman, P., Harris, J., Maxwell, K. & Hojat, M. 2011. Measuring empathy in healthcare profession students using the Jefferson Scale of Physician Empathy: Health provider-student version. *Journal of Interprofessional Care*, 25(4),287-93.
- Filmer, D., Hammer, J.S. & Pritchett, L.H. 2002. Weak links in the chain II: A prescription for health policy in poor countries. *The World Bank Research Observer*, 17(1),47-66.
- Finger, M.E., Cieza, A., Stoll, J., Stucki, G. & Huber, E.O. 2006. Identification of intervention categories for physical therapy, based on the international classification of functioning, disability and health: A Delphi exercise. *Physical Therapy*, 86(9),1203-20.
- Finkelstein, J.A., McMahon, G.T., Peters, A., Cadigan, R., Biddinger, P. & Simon, S.R. 2008. Teaching population health as a basic science at Harvard Medical School. *Academic Medicine*, 83(4),332-7.
- Fiorentino, L.H. 2012. Positive perspectives on the profession: Reframing through appreciative inquiry. *Quest*, 64(4),209-28.
- Fleming, M.L. & Parker, E. 2011. *Introduction to public health*. 2nd ed. Sydney: Elsevier.
- Flexner, A. 1910. *The Flexner report on medical education in the United States and Canada*. Report to the Carnegie Foundation for the Advancement of Teaching, New York. Bulletin Number Four. [Internet]. Boston: DP Updike, Merrymount Press. [cited 2013 May 17] Available from: [http://www.carnegiefoundation.org/sites/default/files/elibrary/Carnegie\\_Flexner\\_Report.pdf](http://www.carnegiefoundation.org/sites/default/files/elibrary/Carnegie_Flexner_Report.pdf)
- Flexner, A. 1990. *Medical education in the United States and Canada*. Birmingham, Ala.: Classics of Medicine Library.

Flick, U., Garms-Homolová, V., Herrmann, W.J., Kuck, J. & Röhnsch, G. 2012. "I can't prescribe something just because someone asks for it ...": Using mixed methods in the framework of triangulation. *Journal of Mixed Methods Research*, 6(2),97-110.

Flynn, L. & Verma, S. 2008. Fundamental components of a curriculum for residents in health advocacy. *Medical Teacher*, 30(7),178-83.

Forrest, C., Martin, D., Holve, E. & Millman, A. 2009. Health services research doctoral core competencies [Internet]. *BMC Health Services Research*, 9(1),107. [<http://dx.doi.org/10.1186/1472-6963-9-107>]

Forrester, D., Copello, A., Waissbein, C. & Pokhrel, S. 2008. Evaluation of an intensive family preservation service for families affected by parental substance misuse. *Child Abuse Review*, 17(6),410-26.

Fourie, M. 2008. South African Society for Physiotherapy annual report. Pretoria: South African Society of Physiotherapy.

Frank, J.R. 2005. The CanMEDS 2005 physician's competency framework: Better standards. Better physicians. Better care. Ottawa, Canada: The Royal College of Physicians and Surgeons of Canada.

Frank, J.R. & Danoff, D. 2007. The CanMEDS initiative: Implementing an outcomes-based framework of physician competencies. *Medical Teacher*, 29(7),642-7.

Frank, J.R. & Langer, B. 2003. Collaboration, communication, management, and advocacy: Teaching surgeons new skills through the CanMEDS Project. *World Journal of Surgery*, 27(8),972-8.

Frank, J.R., Mungroo, R., Ahmad, Y., Wang, M., de Rossi, S. & Horsley, T. 2010a. Toward a definition of competency-based education in medicine: A systematic review of published definitions. *Medical Teacher*, 32(8),631-7.

Frank, J.R., Snell, L.S., Cate, O.T., Holmboe, E.S., Carraccio, C., Swing, S.R., et al. 2010b. Competency-based medical education: Theory to practice. *Medical Teacher*, 32(8),638-45.

Franklin, K.K. & Hart, J.K. 2007. Idea generation and exploration: Benefits and limitations of the policy: Delphi research method. *Innovative Higher Education*, 31(4),237-46.

Franks, A.L., Brownson, R.C., Baker, E.A., Leet, T.L., O'Neill, M.A., Bryant, C., et al. 2005. Prevention research centers: Contributions to updating the public health workforce through training [Internet]. *Preventing Chronic Disease*, 2(2),1-7. [cited 2013 Feb 07]. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1327720/>

Frantz, J. 2009. Challenges facing physiotherapy education in Africa. *Internet Journal of Allied Health Sciences and Practice*, 5(4). [cited 2008 Oct 07]. Available from: <http://Oijahsp.nova.edu>

Frantz, J. & Rhoda, A. 2007. Assessing clinical placements in a B.Sc. physiotherapy program [Internet]. *The Internet Journal of Allied Health Sciences and Practice*, 5(3). [cited 2013 Feb 11]. Available from: <http://Oijahsp.nova.edu>

Frantz, J.M. 2005. Physical inactivity among school learners in Belhar: A public health concern [thesis]. Cape Town, RSA: University of the Western Cape.

Frehywot, S., Mullan, F., Payne, P.W. & Ross, H. 2010. Compulsory service programmes for recruiting health workers in remote and rural areas: Do they work? *Bulletin of the World Health Organization*, 88(5),364-70.

Frenk, J., Chen, L., Bhutta, Z.A., Cohen, J., Crisp, N., Evans, T., et al. 2010. Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*, 376(9756),1923-58.

Fricke, J., Kiley, M., Townsend, G. & Trevitt, C. 2011. Professionalism: What is it, why should we have it and how can we achieve it? *Australian Dental Journal*, 56(1),92-6.

Fried, H. & Leao, A.T. 2007. Using Delphi technique in a consensual curriculum for periodontics. *Journal of Dental Education*, 71(11),1441-6.

Fritsche, L., Greenhalgh, T., Falck-Ytter, Y., Neumayer, H. & Kunz, R. 2002. Do short courses in evidence based medicine improve knowledge and skills? Validation of Berlin

questionnaire and before and after study of courses in evidence based medicine. *BMJ*, 325(7376),1338-41.

Frohlich, M.T. 2002. Techniques for improving response rates in OM survey research. *Journal of Operations Management*, 20(1),53-62.

Fry, R.E. & Frank, B. 2002. *Appreciative inquiry and organizational transformation: Reports from the field*. Westport, Connecticut: Quorum Books.

Furco, A. 2003. Service-learning: A balanced approach to experiential education. *International Journal for Global and Development Education Research*, 11(Oct),71-6.

Furze, J., Black, L., Peck, K. & Jensen, G.M. 2011. Student perceptions of a community engagement experience: Exploration of reflections on social responsibility and professional formation. *Physiotherapy Theory and Practice*, 27(6),411-21.

Futter, M.J. 2003. Developing a curriculum module to prepare students for community-based physiotherapy rehabilitation in South Africa. *Physiotherapy*, 89(1),13-24.

Gadin, K.G., Weiner, G. & Ahlgren, C. 2009. Young students as participants in school health promotion: An intervention study in a Swedish elementary school. *International Journal of Circumpolar Health*, 68(5),498-507.

Gard, G. 2007. Factors important for good interaction in physiotherapy treatment of persons who have undergone torture: A qualitative study. *Physiotherapy Theory and Practice*, 23(1),47-55.

Gelo, O., Braakmann, D. & Benetka, G. 2008. Quantitative and qualitative research: Beyond the debate. *Integrative Psychological and Behavioral Science*, 42(3),266-90.

General Medical Council (United Kingdom) 2009. *Tomorrow's doctors*. London: GMC.

Genêt, F., Mascard, E., Coudeyre, E., Revel, M. & Rannou, F. 2007. The benefits of ambulatory physiotherapy for patients able to leave the surgery department directly for home just after total knee replacement. Development of French guidelines for clinical practice. *Annales de Réadaptation et de Médecine Physique*, 50(9),793-801.

George, D. & Mallery, P. 2003. SPSS for Windows step by step: A simple guide and reference. 11.0 update [Internet]. In J.A. GLIEM and R.R. GLIEM. Interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales research to practice conference in adult, continuing, and community education calculating. Boston: Allyn and Bacon. [cited 2012 Nov 23]. Available from: <http://0-hdl.handle.net.innopac.up.ac.za/1805/344>

George, V., Farrell, M. & Brukwitzki, G. 2002. Performance competencies of the chief nurse executive in an organized delivery system. *Nursing Administration Quarterly*, 26(3),34-43.

Georgetown University Center for Child and Human Development and National Center for Cultural Competence 2007. Cultural competence health practitioner assessment [Internet]. [cited 2012 Nov 25]. Available from: <https://www4.georgetown.edu/uis/keybridge/keyform/form.cfm?formID=277>

Geppert, C.M.A., Arndell, C.L., Clithero, A., Dow-Velarde, L.A., Eldredge, J.P., Kalishman, S., et al. 2011. Reuniting public health and medicine: The University of New Mexico School of Medicine Public Health Certificate. *American Journal of Preventive Medicine*, 41(4, Suppl 3),S214-9.

Gerrish, K. & Lacey, A. 2010. *The research process in nursing*. 6<sup>th</sup> ed. Chichester, UK: Wiley-Blackwell.

Giacomini, M. 2010. Theory matters in qualitative health research. In Denzin N.K. and Lincoln A.E. eds. *The Sage handbook of qualitative research*. Los Angeles, CA: Sage.

Gibbs, T., Durning, S. & van der Vleuten, C. 2011. Theories in medical education: Toward creating a union between educational practice and research traditions. *Medical Teacher*, 33,187-97.

Giddings, L.S. 2006. Mixed-methods research: Positivism dressed in drag? *Journal of Research in Nursing*, 11(3),195-203.

Gill, T.M., Baker, D.I., Gottschalk, M., Gahbauer, E.A., Charpentier, P.A., de Regt, P.T., et al. 2003. A prehabilitation program for physically frail community-living older persons. *Archives of Physical Medicine & Rehabilitation*, 84(3),394-404



Gill, T.M., Baker, D.I., Gottschalk, M., Peduzzi, P.N., Allore, H. & Byers, A. 2002. A program to prevent functional decline in physically frail, elderly persons who live at home. *New England Journal of Medicine*, 347(14),1068-74.

Gill, T.M., Baker, D.I., Gottschalk, M., Peduzzi, P.N., Allore, H. & Van Ness, P.H. 2004. A prehabilitation program for the prevention of functional decline: effect on higher-level physical function. *Archives of Physical Medicine and Rehabilitation*, 85(7),1043-9.

Gill, T.M., McGloin, J.M., Gahbauer, E.A., Shepard, D.M. & Bianco, L.M. 2001. Two recruitment strategies for a clinical trial of physically frail community-living older persons. *Journal of the American Geriatrics Society*, 49(8),1039-45.

Gilson, L., Palmer, N. & Schneider, H. 2005. Trust and health worker performance: Exploring a conceptual framework using South African evidence. *Social Science and Medicine*, 61(7),1418-29.

Gitlin, L.N., Hauck, W.W., Dennis, M.P., Winter, L., Hodgson, N. & Schinfeld, S. 2009. Long-term effect on mortality of a home intervention that reduces functional difficulties in older adults: Results from a randomized trial. *Journal of the American Geriatrics Society*, 57(3),476-81.

Gitlin, L.N., Winter, L., Dennis, M.P. & Hauck, W.W. 2008. Variation in response to a home intervention to support daily function by age, race, sex, and education. *Journals of Gerontology: Series A: Biological Sciences and Medical Sciences*, 63(7),745-50.

Gitlin, L.N., Winter, L., Dennis, M.P., Corcoran, M., Schinfeld, S. & Hauck, W.W. 2006. A randomized trial of a multicomponent home intervention to reduce functional difficulties in older adults. *Journal of the American Geriatrics Society*, 54(5),809-16.

Gleeson, P.B. 2007. Understanding generational competence related to professionalism: Misunderstandings that lead to a perception of unprofessional behavior. *Journal of Physical Therapy Education*, 21(3),23.

Goecke, M.E., Kanashiro, J., Kyamanywa, P. & Hollaar, G.L. 2008. Using CanMEDS to guide international health electives: An enriching experience in Uganda defined for a Canadian surgery resident. *Canadian Journal of Surgery*, 51(4),289-95.

Gondor University Department of Physiotherapy n.d. Physiotherapy curriculum [Internet]. Ethiopia: Gondor University. [cited 2012 Nov 15]. Available from: <http://www.wcpt.org/node/33154>

Gonzales, C. & Leroy, G. 2011. Eliciting user requirements using appreciative inquiry. *Empirical Software Engineering*, 16(6),733-72.

Goodman, C.M. 2006. The Delphi technique: A critique. *Journal of Advanced Nursing*, 12(6),729-34.

Gould, D., Kelly, D., White, I. & Chidgey, J. 2004. Training needs analysis: A literature review and reappraisal. *International Journal of Nursing Studies*, 41(5),471-86.

Grace, S. & Trede, F. 2011. Developing professionalism in physiotherapy and dietetics students in professional entry courses [Internet]. *Studies in Higher Education*, 2011,1-14. [<http://dx.doi.org/10.1080/03075079.2011.603410>]

Graffam, B. 2007. Active learning in medical education: Strategies for beginning implementation. *Medical Teacher*, 29(1),38-42.

Graneheim, U.H. & Lundman, B. 2004. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, 24(2),105-12.

Grant, J. 2010. Two- to 4-year follow-up to a comparison of home versus physical therapy-supervised rehabilitation programs after anterior cruciate ligament reconstruction. *The American Journal of Sports Medicine*, 38(7),1389-94

Grant, J.A., Mohtadi, N.G.H., Maitland, M.E. & Zernicke, R.F. 2005. Comparison of home versus physical therapy supervised rehabilitation programs after anterior cruciate ligament

reconstruction: A randomized clinical trial. *American Journal of Sports Medicine*, 33(9),1288-97.

Grant, R. 2006. *Principles of curriculum design. Understanding medical education series.* Edinburgh, Scotland: Association for the Study of Medical Education (ASME).

Greathouse, J. & Dexter, T. 2000. An accessible analytical approach for investigating what happens between the rounds of a Delphi study. *Journal of Advanced Nursing*, 32(4),1016-24.

Green, J. Forster, A., Bogle, S. & Young, J. 2002. Physiotherapy for patients with mobility problems more than 1 year after stroke: A randomised controlled trial. *The Lancet*, 359(9302),199-203.

Green, J., Young, J., Forster, A., Collen, F. & Wade, D. 2004. Combined analysis of two randomized trials of community physiotherapy for patients more than one year post stroke [Internet]. *Clinical Rehabilitation*, 18(3),249-52. [[http:// dx.doi.org/10.1191/0269215504cr747oa](http://dx.doi.org/10.1191/0269215504cr747oa)]

Greene, J. & Hall, J. 2010. Dialectics and pragmatism: Being of consequence. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of mixed methods in social and behavioral research.* Thousand Oaks, CA: Sage.

Greene, J.C. 2008. Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1),7-22.

Greene, J.C., Caracelli, V.J. & Graham, W.F. 1989. Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3),255-74.

Green, L.W. 1980. *Health education planning: A diagnostic approach.* Palo Alto, CA: Mayfield.

Greenfield, D., Nugus, P., Fairbrother, G., Milne, J. & Debono, D. 2011. Applying and developing health service theory: An empirical study into clinical governance. *Clinical Governance: An International Journal*, 16(1),8-19.

- Greenwood, D.J. & Levin, M. 2005. Reform of the social sciences and of universities through action research. In Denzin N.K. and Lincoln A.E. eds. The Sage handbook of qualitative research. Thousand Oaks, CA: Sage.
- Grimmer, K., Bialocerkowski, A., Kumar, S. & Milanese, S. 2004. Implementing evidence in clinical practice: The 'therapies' dilemma. *Physiotherapy*, 90(4),189-94.
- Grobler, L., Marais, B.J., Mabunda, S.A., Marindi, P.N., Reuter, H., Volmink, J., et al. 2009. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas [Internet]. *Cochrane Database of Systematic Reviews*, 2009(1),1-18. Art. No. CD005314. [<http://dx.doi.org/10.1002/14651858.CD005314.pub2>]
- Groenewald, P., Msemburi, W., Neethling, J., Day, C., Tuoane-Nkhazi, M. & Bradshaw, D. 2012. District health barometer 2010/11. Pretoria, Republic of South Africa: South African Medical Research Council, Health Systems Trust and Statistics South Africa.
- Guba, E.G. & Lincoln, Y.S. 1994. Competing paradigms in qualitative research. In Denzin N.K. and Lincoln A.E. eds. Sage handbook of qualitative research. Thousand Oaks, CA: Sage.
- Guest, G., Bunce, A. & Johnson, L. 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1),59-82.
- Gunn, H. & Goding, L. 2009. Continuing professional development of physiotherapists based in community primary care trusts: A qualitative study investigating perceptions, experiences and outcomes. *Physiotherapy*, 95(3),209-14.
- Gupta, U.G. & Clarke, R.E. 1996. Theory and applications of the Delphi technique: A bibliography (1975–1994). *Technological Forecasting and Social Change*, 53(2),185-211.
- Hagen, N.A., Stiles, C., Nekolaichuk, C., Biondo, P., Carlson, L.E., Fisher, K., et al. 2008. The Alberta Breakthrough Pain Assessment Tool for cancer patients: A validation study using a Delphi process and patient think-aloud interviews. *Journal of Pain and Symptom Management*, 35(2),136-52.

- Haggerty, J., Burge, F., Levesque, J.F., Gass, D., Pineault, R., Beaulieu, M.D., et al. 2007. Operational definitions of attributes of primary health care: Consensus among Canadian experts. *Annals of Family Medicine*, 5(4),336-44.
- Hagopian, A., Spigner, C., Gorstein, J., Mercer, M., Pfeiffer, J., Frey, S., et al. 2008. Developing competencies for a graduate school curriculum in international health. *Public Health Reports*, 123(3),408-14.
- Halcomb, E.J. & Davidson, P.M. 2006. Is verbatim transcription of interview data always necessary? *Applied Nursing Research*, 19(1),38-42.
- Hale, L.A. & Eales, C.J. 2001. Consulting the South African experts in physiotherapeutic stroke rehabilitation. *South African Journal of Physiotherapy*, 57(2),32-40.
- Hall, B. & Howard, K. 2008. A synergistic approach: Conducting mixed methods research with typological and systemic design considerations. *Journal of Mixed Methods Research*, 2(3),248-69.
- Hanafin, S. & Cowley, S. 2006. Quality in preventive and health-promoting services: Constructing an understanding through process. *Journal of Nursing Management*, 14(6),472-82.
- Hannes, K., Lockwood, C. & Pearson, A. 2010. A comparative analysis of three online appraisal instruments' ability to assess validity in qualitative research. *Qualitative Health Research*, 20(12),1736-43.
- Harden, R., Dent, J. & Harden, R. 2005. Curriculum planning and development. A practical guide for medical teachers. Edinburgh: Elsevier Churchill Livingstone, 10-8.
- Harden, R., Sowden, S. & Dunn, W. 1984. Educational strategies in curriculum development: The SPICES model. *Medical Education*, 18(4),284-97.
- Harrits, G.S. 2011. More than method? A discussion of paradigm differences within mixed methods research. *Journal of Mixed Methods Research*, 5(2),150-66.

Hart, C. 1998. *Doing a literature review: Releasing the social science research imagination*. London: Sage.

Hartley, S., Finkenflugel, H., Kuipers, P. & Thomas, M. 2009. Community-based rehabilitation: Opportunity and challenge. *The Lancet*, 374(9704),1803-4.

Hasson, F. & Keeney, S. 2011. Enhancing rigour in the Delphi technique research. *Technological Forecasting and Social Change*, 78(9),1695-704.

Hasson, F., Keeney, S. & McKenna, H. 2000. Research guidelines for the Delphi survey technique. *Journal of Advanced Nursing*, 32(4),1008-15.

Hatala, R., Keitz, S., Wilson, M. & Guyatt, G. 2006. Beyond journal clubs: Moving toward an integrated evidence-based medicine curriculum. *Journal of General Internal Medicine*, 21,538-41.

Hatcher, J.A. & Bringle, R.G. 1997. Reflection: Bridging the gap between theory and practice. *College Teaching*, 45(4),153-64.

Hatcher, J.A. & Erasmus, M.A. 2008. Service-learning in the United States and South Africa: A comparative analysis informed by John Dewey and Julius Nyerere Michigan *Journal of Community Service Learning*, 5(1),49-61.

Hattingh, Dreyer & Roos.<sup>6</sup> 2011. *Aspects of community health*. 3rd ed. Cape Town, RSA: Oxford Southern Africa.

Haunberger, S. 2011. To participate or not to participate: Decision processes related to survey non-response. *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique*, 109(1),39-55.

Hawkins, J.W., Burke, P.J. & Steinberg, S. 2006. Integrating practice issues in managed care into the curriculum: A Delphi survey. *Journal of the American Academy of Nurse Practitioners*, 18(12),582-90.

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<sup>6</sup> No initials provided on the front cover or on the title page.

- Hawkins, R.E., Katsufakis, P.J., Holtman, M.C. & Clauser, B.E. 2009. Assessment of medical professionalism: Who, what, when, where, how, and ... why? *Medical Teacher*, 31(4),348-61.
- Hayward, K.S., Kochniuk, L., Powell, L. & Peterson, T. 2005. Changes in students' perceptions of interdisciplinary practice reaching the older adult through mobile service delivery. *Journal of Allied Health*, 34(4),192-8.
- Hayward, L.M., Blackmer, B. & Markowski, A. 2006. Standardized patients and communities of practice: A realistic strategy for integrating the core values in a physical therapist education program. *Journal of Physical Therapy Education*, 20(2),29-37.
- Health Professions Council of South Africa. 2003. Professional Board for Physiotherapy, Podiatry and Biokinetics. Minimum standards for the training of physiotherapy students [Internet]. Form 96. [cited 2009 Feb 12]. Available from: <http://www.hpcsa.co.za/hpcsa/UserFiles/File/F96PhysMinStandards.doc>
- Heiwe, S., Kajermo, K.N., Tyni-Lenné, R., Guidetti, S., Samuelsson, M., Andersson, I.L., et al. 2011. Evidence-based practice: Attitudes, knowledge and behaviour among allied health care professionals. *International Journal for Quality in Health Care*, 23(2),198-209.
- Helvie, C.O. 1998. *Advanced practice nursing in the community*. Thousand Oaks, CA: Sage.
- Henning, E. 2004. *Finding your way in qualitative research*. Pretoria: Van Schaik.
- Herreid, C.F. 1997. What makes a good case? *Journal of College Science Teaching*, 27(3),163-5.
- Hesse, S. 2011. Comparison of an intermittent high-intensity vs continuous low-intensity physiotherapy service over 12 months in community-dwelling people with stroke: A randomized trial. *Clinical Rehabilitation*, 25(2),146-56.
- Hesse-Biber, S.N. 2010. *Mixed methods research: merging theory with practice*. New York: Guilford Press.

- Hoat, L.N. & Wright, E.P. 2008. Community-university partnership: Key elements for improving field teaching in medical schools in Vietnam [Internet]. *Rural and Remote Health*, 8(4),894, [cited 2012 Jun 18]. Available from: <http://www.rrh.org.au>
- Hodges, D., McLachlan, J. & Finn, G. 2009. Exploring reflective 'critical incident' documentation of professionalism lapses in a medical undergraduate setting [Internet]. *BMC Medical Education*, 9(1),4. [<http://dx.doi.org/10.1186/1472-6920-9-44>]
- Holey, E.A., Feeley, J.L., Dixon, J. & Whittaker, V.J. 2007. An exploration of the use of simple statistics to measure consensus and stability in Delphi studies [Internet]. *BMC Medical Research Methodology*, 7(2007),52. [<http://dx.doi.org/10.1186/1471-2288-7-52>]
- Hong, M., Lee, W.H., Park, J.H., Yoon, T.Y., Moon, D.S., Lee, S.M., et al. 2012. Changes of empathy in medical college and medical school students: 1-year follow up study [Internet]. *BMC Medical Education*, 12(1),122. [cited 2012 Nov 21]. Available from: <http://www.biomedcentral.com/1472-6920/12/122>
- Horton, R. 2010. A new epoch for health professionals' education. *The Lancet*, 376(9756),1875-7.
- Houghton, C., Casey, D., Shaw, D. & Murphy, K. 2013. Rigour in qualitative case-study research. *Nurse Researcher*, 20(4),12-7.
- Howe, A., Smajdor, A. & Stockl, A. 2012. Towards an understanding of resilience and its relevance to medical training. *Medical Education*, 46(4),349-56.
- Howe, K.R. 2012. Mixed methods, triangulation, and causal explanation. *Journal of Mixed Methods Research*, 6(2),89-96.
- Hsieh, H.F. & Shannon, S.E. 2005. Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9),1277-88.
- Hsu, C. & Sandford, B.A. 2007. The Delphi technique: Making sense of consensus.practical assessment, research, and evaluation. 12(1),2-8.



- Hultberg, E., Lannroth, K. & Allebeck, P. 2007. Effects of a co-financed interdisciplinary collaboration model in primary health care on service utilisation among patients with musculoskeletal disorders. *Work*, 28(3),239-47.
- Hunt, J.B., Bonham, C. & Jones, L. 2011. Understanding the goals of service learning and community-based medical education: A systematic review. *Academic Medicine*, 86(2),246-51.
- Hunt, R.J. & Swiggum, P. 2007. Being in another world: Transcultural student experiences using service learning with families who are homeless. *Journal of Transcultural Nursing*, 18(2),167-74.
- Hutchings, D., Lundrigan, E., Mathews, M., Lynch, A. & Goosney, J. 2011. Keeping community health care workers safe [Internet]. *Home Health Care Management Practice*. [http://dx.doi.org/10.1177/1084822309360383]
- Ihantola, E.M. & Kihn, L.A. 2011. Threats to validity and reliability in mixed methods accounting research. *Qualitative Research in Accounting & Management*, 8(1),39-58.
- Ilic, D. 2009. Assessing competency in evidence based practice: Strengths and limitations of current tools in practice [Internet]. *BMC Medical Education*, 9(1),53. [http://dx.doi.org/10.1186/1472-6920-9-53]
- Instructional Assessment Resources. 2007. Assess teaching. Document analysis: Overview. [Internet]. [cited 2012 Dec 20]. Available from: <http://www.utexas.edu/academic/ctl/assessment/iar/teaching/plan/method/doc-analysis.php>
- Iobst, W.F., Sherbino, J., Cate, O.T., Richardson, D.L., Dath, D., Swing, S.R., et al. 2010. Competency-based medical education in postgraduate medical education. *Medical Teacher*, 32(8),651-6.
- Iramaneerat, C. 2009. Instruction and assessment of professionalism for surgery residents. *Journal of Surgical Education*, 66(3),158-62.

Irvine, L., Conroy, S.P., Sach, T., Gladman, J.R., Harwood, R.H., Kendrick, D., et al. 2010. Cost-effectiveness of a day hospital falls prevention programme for screened community-dwelling older people at high risk of falls. *Age and Ageing*, 39(6),710-6.

Ivankova, N.V. & Kawamura, Y. 2010. Emerging trends in the utilization of integrated designs in the social, behavioral, and health sciences. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.

Jacques, P.F. 2004. Cultural competency curriculum: Components for inclusion in physician assistant education. *Perspective on Physician Assistant Education*, 15(2),102-5.

Jenkins, L., Mash, B. & Derese, A. 2012. Development of a portfolio of learning for postgraduate family medicine training in South Africa: A Delphi study. *BMC Family Practice*, 13(1),1-11.

Jess, M., Atencio, M. & Thorburn, M. 2011. Complexity theory: Supporting curriculum and pedagogy developments in Scottish physical education. *Sport, Education and Society*, 16(2),179-99.

Jessep, S.A., Walsh, N.E., Ratcliffe, J. & Hurley, M.V. 2009. Long-term clinical benefits and costs of an integrated rehabilitation programme compared with outpatient physiotherapy for chronic knee pain. *Physiotherapy*, 95(2),94-102.

Jim, C.Y. & Xu, S.S.W. 2002. Stifled stakeholders and subdued participation: Interpreting local responses toward Shimentai Nature Reserve in South China. *Environmental Management*, 30(3),327-41.

Jimenez, M., Tan-Billet, J., Babineau, J., Jimenez, J.E., Billet, T., Flash, C., et al. 2008. The promise clinic: A service learning approach to increasing access to health care. *Journal of Health Care for the Poor and Underserved*, 19(3),935-43.

Jippes, E., van Engelen, J.M.L., Brand, P.L.P. & Oudkerk, M. 2010. Competency-based (CanMEDS) residency training programme in radiology: Systematic design procedure, curriculum and success factors. *European Radiology*, 20(4),967-77.

- Johansson, A.C., Linton, S.J., Bergkvist, L., Nilsson, O. & Cornefjord, M. 2009a. Clinic-based training in comparison to home-based training after first-time lumbar disc surgery: A randomised controlled trial. *European Spine Journal*, 18(3),398-409.
- Johansson, H., Weinehall, L. & Emmelin, M. 2009b. 'It depends on what you mean': A qualitative study of Swedish health professionals' views on health and health promotion [Internet]. *BMC Health Services Research*, 9(1),191. [<http://dx.doi.org/10.1186/1472-6963-9-191>]
- Johnson, B. & Gray, R. 2010. A history of philosophical and theoretical issues for mixed methods research. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage. 69-94 p.
- Johnson, R.B. & Onwuegbuzie, A.J. 2004. Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7),14-26.
- Johnson, R.B., Onwuegbuzie, A.J. & Turner, L.A. 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2),112-33.
- Johnston, T.E. & Wainwright, S.F. 2011. Cycling with functional electrical stimulation in an adult with spastic diplegic cerebral palsy. *Physical Therapy*, 91(6),970-82.
- Jones, R., Jenkins, F., Mueller, J., Boyce, R. & Diener, I. 2011. Management quality achieving excellence in physiotherapy service provision. Paper presented at 2011 World Confederation for Physical Therapy Conference (WCPT 2011). Amsterdam, Netherlands.
- Joyner, B. & Young, L. 2006. Teaching medical students using role play: Twelve tips for successful role plays. *Medical Teacher*, 28(3),225-9.
- Jünger, S., Payne, S., Brearley, S., Ploenes, V. & Radbruch, L. 2012. Consensus building in palliative care: A Europe-wide Delphi study on common understandings and conceptual differences. *Journal of Pain and Symptom Management*, 44(2),192-205.

- Kalb, K.B., Cherry, N.M., Kauzloric, J., Brender, A., Green, K., Miyagawa, L., et al. 2006. A competency-based approach to public health nursing performance appraisal. *Public Health Nursing*, 23(2),115-38.
- Kamaka, M.L. 2010. Designing a cultural competency curriculum: Asking the stakeholders. *Hawaii Medical Journal*, 69(6 Suppl 3),S31-4.
- Karnieli-Miller, O., Vu, R., Frankel, Matthew C. Holtman, R.M., Clyman, S.G., Hui, S.L., et al. 2011. Which experiences in the hidden curriculum teach students about professionalism? [Internet]. *Academic Medicine*, 86(3),369. [<http://dx.doi.org/10.1097/ACM.0b013e3182087d15>]
- Kaufman, A., Powell, W., Alfero, C., Pacheco, M., Silverblatt, H., Anastasoff, J., et al. 2010. Health extension in New Mexico: An academic health center and the social determinants of disease. *Annals of Family Medicine*, 8(1),73-82.
- Keays, S.L., Bullock-Saxton, J.E., Newcombe, P. & Bullock, M.I. 2006. The effectiveness of a pre-operative home-based physiotherapy programme for chronic anterior cruciate ligament deficiency. *Physiotherapy Research International*, 11(4),204-18.
- Keefe, M.R. & Pesut, D. 2004. Appreciative inquiry and leadership transitions. *Journal of Professional Nursing*, 20(2),103-09.
- Keeney, S., Hasson, F. & McKenna, H. 2006. Consulting the oracle: Ten lessons from using the Delphi technique in nursing research. *Journal of Advanced Nursing*, 53(2),205-12.
- Kelley, P.W. 2011. Transforming the education of health professionals to confront the burden of NCD: Commission on Education of Health Professionals for the 21<sup>st</sup> Century. *Global Heart*, 6(4),179-81.
- Kendall, E., Muenchberger, H. & Catalano, T. 2009. The move towards community-based rehabilitation in industrialised countries: Are we equipped for the challenge? *Disability and Rehabilitation*, 31(26),2164-173.

- Keogh, J.J., Fourie, W.J., Watson, S. & Gay, H. 2010. Involving the stakeholders in the curriculum process: A recipe for success? *Nurse Education Today*, 30(1),37-43.
- Kerkering, K.W. & Novick, L.F. 2008. Population health into medical school education: Employing the framework developed by the Healthy People Curriculum Task Force. *Academic Medicine*, 83(4),345-51.
- Kern, D.E. 1998. Curriculum development for medical education: A six step approach. Baltimore, MD: Johns Hopkins University Press.
- Kern, D.E., Thomas, P.A. & Hughes, M.T. 2009. Curriculum development for medical education: A six-step approach. Baltimore, MD: Johns Hopkins University Press.
- Kernick, D. & Mitchell, A. 2010. Working with lay people in health service research: A model of co-evolution based on complexity theory. *Journal of Interprofessional Care*, 24(1),31-40.
- Keus, S.H., Nijkrake, M.J., Borm, G.F., Kwakkel, G., Roos, R.A., Berendse, H.W., et al. 2010. The ParkinsonNet trial: Design and baseline characteristics. *Movement Disorders*, 25(7),830-7.
- Khader, Y.S., Batayha, W. & Al-Omari, M. 2011. The effect of evidence-based medicine (EBM) training seminars on the knowledge and attitudes of medical students towards EBM. *Journal of Evaluation in Clinical Practice*, 17(4),640-3.
- Khan, A.Z. 2013. Non-academic attributes of hidden curriculum in medical schools. *Journal of the College of Physicians and Surgeons Pakistan*, 23(1),5-9.
- Khan, K. & Coomarasamy, A. 2006. A hierarchy of effective teaching and learning to acquire competence in evidence-based medicine [Internet]. *BMC Medical Education*, 6(12),59. [<http://dx.doi.org/10.1186/1472-6920-6-59>]
- Khan, N.B., Knight, S. & Esterhuizen, T. 2009. Perceptions of and attitudes to the compulsory community service programme for therapists in KwaZulu-Natal. *The South African Journal of Communication Disorders*, 56(2009),17-22.

Kiessling, C., Dieterich, A., Fabry, G., Hölzer, H., Langewitz, W., Mühlinghaus, I., et al. 2010. Communication and social competencies in medical education in German-speaking countries. The Basel Consensus Statement: Results of a Delphi Survey. *Patient Education and Counseling*, 81(2),259-66.

Kiguli-Malwadde, E., Kijjambu, S., Kiguli, S., Galukande, M., Mwanika, A., Luboga, S., et al. 2006. Problem based learning, curriculum development and change process at Faculty of Medicine, Makerere University, Uganda. *African Health Sciences*, 6(2),127-30.

Kington, A., Sammons, P., Day, C. & Regan, E. 2011. Stories and statistics: Describing a mixed methods study of effective classroom practice. *Journal of Mixed Methods Research*, 5(2),103-25.

Kirchberger, I., Stamm, T., Cieza, A. & Stucki, G. 2007. Does the comprehensive ICF core set for rheumatoid arthritis capture occupational therapy practice? A content-validity study. *Canadian Journal of Occupational Therapy. Revue Canadienne d'Ergotherapie*, 74(2),267-80.

Klein, D., Staples, J., Pittman, C. & Stepanko, C. 2012. Using electronic clinical practice audits as needs assessment to produce effective continuing medical education programming. *Medical Teacher*, 34(2),151-4.

Kleinman, A., Eisenberg, L. & Good, B. 1978. Culture, illness, and care: Clinical lessons from anthropologic and cross-cultural research. *Annals of Internal Medicine*, 88(2),251-8.

Klemenc-Ketis, Z. & Kersnik, J. 2011. Using movies to teach professionalism to medical students [Internet]. *BMC Medical Education*, 11(1),60. [<http://dx.doi.org/10.1186/1472-6920-11-60>]

Klopp, A. & Nakanishi, A. 2012. Art Days: Two medical students reflect on the value of cultural immersion and cultural safety: MDs to be. *BC Medical Journal*, 54(3),126-9.

Knibbs, K., Underwood, J., MacDonald, M., Schoenfeld, B., Lavoie-Tremblay, M., Crea-Arsenio, M., et al. 2012. Appreciative inquiry: A strength-based research approach to building Canadian public health nursing capacity. *Journal of Research in Nursing*, 17(5),484-94.

- Knight, P.T. 2010. Complexity and curriculum: A process approach to curriculum-making. *Teaching in Higher Education*, 6(3),369-81.
- Kohatsu, N.D., Robinson, J.G. & Torner, J.C. 2004. Evidence-based public health: An evolving concept. *American Journal of Preventive Medicine*, 27(5),417-21.
- Krause, M.W. 2007. Service learning in physiotherapy taken to a new level: Experiences in South Africa. *Physical Therapy Reviews*, 12(4),277-84.
- Krause, M.W., Viljoen, M.J., Nel, M.M. & Joubert, G. 2006. Development of a framework with specific reference to exit-level outcomes for the education and training of South African undergraduate physiotherapy students. *Health Policy*, 77(1),37-42.
- Krippendorff, K. 2004. Reliability in content analysis: Some common misconceptions and recommendations. *Human Communication Research*, 30(3),411-33.
- Krishnan, S., Nash, F., Baker, N., Fowler, D. & Rayman, G. 2008. Reduction in diabetic amputations over 11 years in a defined UK population: Benefits of multidisciplinary team work and continuous prospective audit. *Diabetes Care*, 31(1),99-101.
- Kriska, A.M., Bayles, C., Cauley, J.A. & LaPorte, R.E. 1986. A randomized exercise trial in older women: Increased activity over two years and the factors associated with compliance. *Medicine and Science in Sports and Exercise*, 18(1986),557-62.
- Kuhn, T. 1996. *The structure of scientific revolutions*. 2. Chicago: University of Chicago Press.
- Kuisma, R. 2002. A randomized, controlled comparison of home versus institutional rehabilitation of patients with hip fracture. *Clinical Rehabilitation*, 16(5),553-61.
- Kuisma, R. 2007. Portfolio assessment of an undergraduate group project. *Assessment and Evaluation in Higher Education*, 32(5),557-69.
- Lack, M.L.B.J.C.B.P.J. 2009. Weighting of items in a tutorial performance evaluation instrument: Statistical analysis and results: Original research. *Health SA Gesondheid*, 14(1),1-5.

Ladhani, Z., Scherpbier, A.J.J.A. & Stevens, F.C.J. 2012. Competencies for undergraduate community-based education for the health professions: A systematic review. *Medical Teacher*, 34(9),733-43.

Ladyshevsky, R.K. & Gardner, P. 2008. Peer assisted learning and blogging: A strategy to promote reflective practice during clinical fieldwork. *Australasian Journal of Educational Technology*, 24(3),241-57.

Lähteenmäki, M. 2005. Reflectivity in supervised practice: Conventional and transformative approaches to physiotherapy. *Learning in Health and Social Care*, 4(1),18-28.

Landeta, J. 2006. Current validity of the Delphi method in social sciences. *Technological Forecasting and Social Change*, 73(5),467-82.

Landis, J.R. & Koch, G.G. 1977. The measurement of observer agreement for categorical data [Internet]. *Biometrics*, 33,159-74. In Stemler, Steve (2001). An overview of content analysis. *Practical Assessment, Research and Evaluation*, 7(17):137-146. [cited 5 Oct 2012]. Available from: <http://PAREonline.net/getvn.asp?v=7&n=17>

Lane, C. & Rollnick, S. 2007. The use of simulated patients and role-play in communication skills training: A review of the literature to August 2005. *Patient Education and Counseling*, 67(1-2),13-20.

Lane, C., Hood, K. & Rollnick, S. 2008. Teaching motivational interviewing: Using role play is as effective as using simulated patients. *Medical Education*, 42(6),637-44.

Lane, C., Huws-Thomas, M., Hood, K., Rollnick, S., Edwards, K. & Robling, M. 2005. Measuring adaptations of motivational interviewing: The development and validation of the behavior change counseling index (BECCI). *Patient Education and Counseling*, 56(2),166-73.

Latham, H., Giffard, L. & Pollard, M. 2007. University and health service partnership: A model to deliver undergraduate nurse education in rural Australia. *Collegian*, 14(1),5-10.

Lattanzi, J. & Purnell, L.D. 2006. Developing cultural competence in physical therapy practice [Internet]. Philadelphia, PA: FA Davis. In: M. ROMANELLO & K. HOLTGREFFE. 2009. Teaching



for cultural competence in non-diverse environments. *The Internet Journal of Allied Health Sciences and Practice*, 7(4). [cited 2012 Dec 18]. Available from: <http://ijahsp.nova.edu>

Lazarou, J., Hopyan, J., Panisko, D. & Tai, P. 2011. Neurology for internal medicine residents: Working towards a national Canadian curriculum consensus. *Medical Teacher*, 33(2),e65-8.

Lee, J.H., Choi, Y.J., Volk, R.J., Kim, S.Y., Kim, Y.S., Park, H.K., et al. 2007. Defining the concept of primary care in South Korea using a Delphi method. *Family Medicine*, 39(6),425-31.

Lee, T.S.-M., Sullivan, G. & Lansbury, G. 2006. Physiotherapists' communication strategies with clients from cultural diverse backgrounds. *Advances in Physiotherapy*, 8(4),168-74.

Leech, N.L. & Onwuegbuzie, A.J. 2009. A typology of mixed methods research designs. *Quality and Quantity*, 43(2),265-75.

Leech, N.L., Onwuegbuzie, A.J. & Combs, J.P. 2011. Writing publishable mixed research articles: Guidelines for emerging scholars in the health sciences and beyond [Internet]. *International Journal of Multiple Research Approaches*, 5(1),7-24.

Lehmann, U. & Sanders, D. 2007. Community health workers: What do we know about them? [cited 2011 Nov 11]. Available from: [http://0-www.who.int.innopac.up.ac.za/hrh/documents/community\\_health\\_workers.pdf](http://0-www.who.int.innopac.up.ac.za/hrh/documents/community_health_workers.pdf)

Leo, M.C., Peterson, D., Haas, M., LeFebvre, R. & Bhalerao, S. 2012. Development and psychometric evaluation of an evidence-based practice questionnaire for a chiropractic curriculum. *Journal of Manipulative and Physiological Therapeutics*, 35(9),692-700.

Levin, R. & Herbert, M. 2001. Delivering health care services in the community: A multidisciplinary perspective. *Social Work in Health Care*, 34(1-2),89-99.

Lewis, E.Y., Motton, F. & Baker, E.A. [n.d]. Improving and translating the evidence: Increasing physical activity among adults in racially/ethnically diverse communities in the United States. Saint Louis University School of Public Health, Saint Louis: Prevention Research Centre.

- Liabsuetrakul, T., Suntharasaj, T., Tangtrakulwanich, B., Uakritdathikarn, T. & Pornsawat, P. 2009. Longitudinal analysis of integrating evidence-based medicine into a medical student curriculum. *Family Medicine*, 41(8),585-8.
- Lin, I.B., Beattie, N., Spitz, S. & Ellis, A. 2009. Developing competencies for remote and rural senior allied health professionals in Western Australia [Internet]. *Rural and Remote Health*, 9(2),1115 [cited 2012 March 01]. Available from: <http://www.rrh.org.au/Lincoln>
- Lin, J.H., Hsieh, C.L., Lo, S.K., Chai, H.M. & Liao, L.R. 2004. Preliminary study of the effect of low-intensity home-based physical therapy in chronic stroke patients. *Kaohsiung Journal of Medical Sciences*, 20(1),18-23.
- Lincoln Y.S. & Guba, E.G. 1985. *Naturalistic inquiry*. Newbury Park, CA: Sage.
- Lind, C. & Smith, D. 2008. Analyzing the state of community health nursing: Advancing from deficit to strengths-based practice using appreciative inquiry. *Advances in Nursing Science*, 31(1),28-41.
- Lindquist, I., Engardt, M., Garnham, L., Poland, F. & Richardson, B. 2006. Development pathways in learning to be a physiotherapist. *Physiotherapy Research International*, 11(3),129-39.
- Linke, A. & Zerfass, A. 2012. Future trends in social media use for strategic organisation communication: Results of a Delphi study. *Public Communication Review*, 2(2),17-27.
- Linstone, H.A. & Turoff, M. 2002. *The Delphi method: Techniques and applications* [Internet]. [cited 2012 July 14]. Available from: <http://is.njit.edu/pubs/delphibook/>
- Lobstein, T., Baur, L. & Uauy, R. 2004. Obesity in children and young people: A crisis in public health [Internet]. *Obesity Reviews*, 5(Suppl 1),S4-85. [<http://dx.doi.org/10.1111/j.1467-789X.2004.00133.x>]
- Lollar, D.J. & Crews, J.E. 2003. Redefining the role of public health in disability. *Annual Review of Public Health*, 24(1),195-208.

- Loo, R. 2002. The Delphi method: A powerful tool for strategic management. *Policing*, 25(4),762-9.
- Lord, S., McPherson, K.M., McNaughton, H.K., Rochester, L. & Weatherall, M. 2008. How feasible is the attainment of community ambulation after stroke? A pilot randomized controlled trial to evaluate community-based physiotherapy in subacute stroke. *Clinical Rehabilitation*, 22(3),215-25.
- Luckcock, T. 2007. The soul of teaching and professional learning: An appreciative inquiry into the Enneagram of reflective practice. *Educational Action Research*, 15(1),127-45.
- Luukinen, H., Lehtola, S., Jokelainen, J., Vaananen-Sainio, R., Lotvonen, S. & Koistinen, P. 2007. Pragmatic exercise-oriented prevention of falls among the elderly: A population-based, randomized, controlled trial. *Preventive Medicine*, 44(3),265-71.
- Luyt, R. 2012. A framework for mixing methods in quantitative measurement development, validation, and revision: A case study. *Journal of Mixed Methods Research*, 6(4),294-316.
- Mackellar, A., Ashcroft, D.M., Bell, D., James, D.H. & Marriott, J. 2007. Identifying criteria for the assessment of pharmacy students' communication skills with patients. *American Journal of Pharmaceutical Education*, 71(3),50.
- Macmillan Dictionary [Internet]. 2011. [cited: 2011 August 7]. Available from: <http://www.macmillandictionary.com/dictionary/british/audit>
- MacNeily, A.E. 2007. CanMEDS: Time to teach the teachers [Commentary]. *Canadian Urology Association Journal*, 1(2007),370.
- Maeshiro, R., Evans, C.H., Stanley, J.M., Meyer, S.M., Spolsky, V.W., Shannon, S.C., et al. 2011. Using the clinical prevention and population health curriculum framework to encourage curricular change. *American Journal of Preventive Medicine*, 40(2),232-44.
- Magnusson, R.S. 2009. Rethinking global health challenges: Towards a 'global compact' for reducing the burden of chronic disease. *Public Health*, 123(3),265-74.

- Mak, D.B. & Miflin, B. 2012. Clinical audit in the final year of undergraduate medical education: Towards better care of future generations. *Medical Teacher*, 34(4),e251-7.
- Maleka, D., Stewart, A., Douglas, M. & Franzsen, D. 2008. Physiotherapy services required at primary health care level in Gauteng and Limpopo provinces [Service Provider's perspective: Physiotherapists/assistants]. *South African Journal of Physiotherapy*, 64(1),2-7.
- Mallow, A. & Cameron-Kelly, D. 2006. Unraveling the layers of cultural competence: Exploring the meaning of meta-cultural competence in the therapeutic community. *Journal of Ethnicity in Substance Abuse*, 5(3),63-74.
- Management Sciences for Health (MSH). 2010. Health systems in action: An eHandbook for leaders and managers [Internet]. Cambridge, MA: MSH. [cited 2013 Jan 15] Available from: <http://www.msh.org/resource-center/health-systems-in-action.cfm>
- Mangione, K.K., Craik, R.L., Palombaro, K.M., Tomlinson, S.S. & Hofmann, M.T. 2010. Home-based leg-strengthening exercise improves function 1 year after hip fracture: A randomized controlled study. *Journal of the American Geriatrics Society*, 58(10),1911-7.
- Mann, K., Gordon, J. & MacLeod, A. 2009. Reflection and reflective practice in health professions education: A systematic review. *Advances in Health Sciences Education*, 14(4),595-621.
- Marshall, A.P., Currey, J., Aitken, L.M. & Elliott, D. 2007. Key stakeholders' expectations of educational outcomes from Australian critical care nursing courses: A Delphi study. *Australian Critical Care*, 20(3),89-99.
- Mash, B., Couper, I. & Hugo, J. 2006. Building consensus on clinical procedural skills for South African family medicine training using the Delphi technique [Internet]. *SA Family Practice*, 48(10),14. [cited 2009 Apr 19]. Available from: <http://www.safpj.co.za>
- Mason, P. & Butler, C. 2010. Health behavior change: A guide for practitioners. 2nd ed. Edinburgh: Churchill Livingstone/Elsevier.

- Masud, T., Coupland, C., Drummond, A., Gladman, J., Kendrick, D., Sach, T., et al. 2006. Multifactorial day hospital intervention to reduce falls in high risk older people in primary care: A multi-centre randomised controlled trial [ISRCTN46584556]. *Trials*, 7(1),5.
- Mauthner, N.S. & Doucet, A. 2003. Reflexive accounts and accounts of reflexivity in qualitative data analysis. *Sociology*, 37(3),413-31.
- Mc Ateer, M.F. & Murray, R. 2003. The humanities in a course on loss and grief. *Physiotherapy*, 89(2),97-103.
- McAdam, E. & Mirza, K.A.H. 2009. Drugs, hopes and dreams: Appreciative inquiry with marginalized young people using drugs and alcohol. *Journal of Family Therapy*, 31(2),175-93.
- McCluskey, A. & Middleton, S. 2010. Delivering an evidence-based outdoor journey intervention to people with stroke: Barriers and enablers experienced by community rehabilitation teams [Internet]. *BMC Health Services Research*, 10(1),18. [<http://dx.doi.org/10.1186/1472-6963-10-18>]
- McCready, T. 2007. Portfolios and the assessment of competence in nursing: A literature review. *International Journal of Nursing Studies*, 44(1),143-51.
- McDonald, R.E., Chesson, R.A., Burnett, V.W., Funai, G.J., Holdsworth, L.K. & Upton, C.D.J. 2003. Pre-discharge home assessment visits with elderly patients: Collaborative study of current practice. *Physiotherapy*, 89(5),323-3.
- McGhee, G., Marland, G.R. & Atkinson, J. 2007. Grounded theory research: Literature reviewing and reflexivity. *Journal of Advanced Nursing*, 60(3),334-42.
- McKean, S.C.W., Budnitz, T.L., Dressler, D.D., Amin, A.N. & Pistoria, M.J. 2006. How to use the core competencies in hospital medicine: A framework for curriculum development. *Journal of Hospital Medicine*, 1(1),57-67.
- McKimm, J. 2010. Current trends in undergraduate medical education: Program and curriculum design. *Samoa Medical Journal*, 1(2),40-8.

McLeod, P., Steinert, Y., Chalk, C., Cruess, R., Cruess, S., Meterissian, S., et al. 2009. Which pedagogical principles should clinical teachers know? Teachers and education experts disagree. *Medical Teacher*, 31(4),117-24.

McMeeken, J. 2007. Physiotherapy education in Australia. *Physical Therapy Reviews*, 12(2),83-91.

McNair, R.P. 2005. The case for educating health care students in professionalism as the core content of interprofessional education. *Medical Education*, 39(5),456-64.

Medical Rehabilitation Therapists (Registration) Board of Nigeria. n.d. Harmonised curriculum of studies for the Bachelor of Physiotherapy (B.PT.) degree programme in Nigerian universities as a standard control measure [Internet]. [cited 2011 Nov 11]. Available from: <http://www.wcpt.org/node/33154>

Mehnen, N., Mose, I. & Strijker, D. 2012. The Delphi method as a useful tool to study governance and protected areas? *Landscape Research*, 2012(1),1-18.

Mengshoel, A.M. 2012. Mixed methods research: So far easier said than done? *Manual Therapy*, 17(4),373-5.

Mennin, S. 2009. Self-organisation, integration and curriculum in the complex world of medical education. *Medical Education*, 44(1),20-30.

Mennin, S. 2010a. Complexity and health professions education: A basic glossary. *Journal of Evaluation in Clinical Practice*, 16(4),838-40.

Mennin, S. 2010b. Teaching, learning, complexity and health professions education. Paper presented at The 2010 IAMSE Conference, July 10-13, 2010. New Orleans, LA, USA.

Merriam-Webster Online Dictionary. 2012. [cited 2012 November]. Available from: <http://www.merriam-webster.com/dictionary>

Mertens, D.M. & Hesse-Biber, S. 2012. Triangulation and mixed methods research: Provocative positions. *Journal of Mixed Methods Research*, 6(2),75-9.

Mertens, D.M. & Wilson, A.T. 2012. Program evaluation theory and practice: A comprehensive guide. New York, NY: Guilford Press.

Mertens, D.M. 2012. What comes first? The paradigm or the approach? *Journal of Mixed Methods Research*, 6(4),255-7.

Metcalfe, C., Lewin, R., Wisner, S., Perry, S., Bannigan, K. & Moffett, J.K. 2001. Barriers to implementing the evidence base in four NHS therapies: Dietitians, occupational therapists, physiotherapists, speech and language therapists. *Physiotherapy*, 87(8),433-41.

Mezey, M., Mitty, E., Burger, S.G. & McCallion, P. 2008. Healthcare professional training: A comparison of geriatric competencies. *Journal of the American Geriatrics Society*, 56(9),1724-9.

Michael, S. 2005. The promise of appreciative inquiry as an interview tool for field research. *Development in Practice*, 15(2),222-30.

Michaelsen, L.K., Knight, A.B. & Fink, L.D. eds. 2004. Team-based learning: A transformative use of small groups in college teaching. Sterling, VA: Stylus.

Michelotti, A., Steenks, M.H., Farella, M., Parisini, F., Cimino, R. & Martina, R. 2004. The additional value of a home physical therapy regimen versus patient education only for the treatment of myofascial pain of the jaw muscles: Short-term results of a randomized clinical trial. *Journal of Orofacial Pain*, 18(2),114-25.

Mickelson, J. & MacNeily, A. 2008. Translational education: Tools for implementing the CanMEDS competencies in Canadian urology residency training. *Canadian Urological Association Journal*, 2(4),395-404.

Miller, F.A. & Alvarado, K. 2005. Incorporating documents into qualitative nursing research. *Journal of Nursing Scholarship*, 37(4),348-53.

Miller, G.E. 1990. The assessment of clinical skills/competence/performance. *Academic Medicine*, 65(9 Suppl),S63-7.

- Miller, P.A. & Tuekam, R. 2011. The feasibility and acceptability of using a portfolio to assess professional competence. *Physiotherapy Canada*, 63(1),78-85.
- Mishra, P. & Bhatnagar, J. 2012. Appreciative inquiry: Models and applications. *Indian Journal of Industrial Relations*, 47(3),543-58.
- Mitchell, C., Walker, J., Walters, S., Morgan, A.B., Binns, T. & Mathers, N. 2005. Costs and effectiveness of pre- and post-operative home physiotherapy for total knee replacement: Randomized controlled trial. *Journal of Evaluation in Clinical Practice*, 11(3),283-92.
- Moffett, J.A.K., Jackson, D.A., Richmond, S., Hahn, S., Coulton, S., Farrin, A., et al. 2005. Randomised trial of a brief physiotherapy intervention compared with usual physiotherapy for neck pain patients: outcomes and patients' preference. *British Medical Journal*, [Internet] 330(7482),75 [<http://dx.doi.org/10.1136/bmj.38286.493206.82>]
- Monrouxe, L.V., Rees, C.E. & Hu, W. 2011. Differences in medical students' explicit discourses of professionalism: Acting, representing, becoming. *Medical Education*, 45(6),585-602.
- Moon, J.A. 2004. *A handbook of reflective and experiential learning: Theory and practice* New York, NY: RoutledgeFalmer.
- Moore, M. 2008. Appreciative inquiry: The why? the what? The how? *Practice Development in Health Care*, 7(4),214-20.
- Morcke, A.M. & Eika, B. 2009. Medical faculty and curriculum design: 'No, no, it's like this: You give your lectures ...'. *Medical Teacher*, 31(7),642-48.
- Morcke, A.M., Wichmann-Hansen, G., Nielsen, D.G. & Eika, B. 2006. Complex perspectives on learning objectives: Stakeholders' beliefs about core objectives based on focus group interviews. *Medical Education*, 40(7),675-81.
- Morgan, D.L. 2007. Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1),48-76.



Mori, B., Batty, H.P. & Brooks, D. 2008. The feasibility of an electronic reflective practice exercise among physiotherapy students. *Medical Teacher*, 30(8),e232-8.

Morris, J. & Stew, G. 2007. Collaborative reflection: How far do 2:1 models of learning in the practice setting promote peer reflection? *Reflective Practice*, 8(3),419-32.

Morrow, C.B., Epling, J.W. & Novick, L.F. 2003. A user's guide to teaching the C-POP series. *American Journal of Preventive Medicine*, 24(4, Suppl),S116-7.

Morse, J.M. 2010. Simultaneous and sequential qualitative mixed method designs. *Qualitative Inquiry*, 16(6),483-91.

Morse, J.M., Barrett, M., Mayan, M., Olson, K. & Spiers, J. 2002. Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods*, 1(2),13-22.

Morse, J.M., Niehaus, L., Wolfe, R.R. & Wilkins, S. 2006. The role of the theoretical drive in maintaining validity in mixed-method research. *Qualitative Research in Psychology*, 3(4),279-91.

Moss, J.R., Mickan, S.M., Fuller, J.D., Procter, N.G., Waters, B.A. & O'Rourke, P.K. 2006. Mentoring for population health in general practice divisions. *Australian Health Review*, 30(1),46-55.

Mostert-Wentzel, K. 2011. Competency framework for community physiotherapy in South Africa. Minutes. South African Society of Physiotherapy. Johannesburg, Republic of South Africa, 23 October 2011.

Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. 2013a. Status of undergraduate community-based and public health physiotherapy education in South Africa. *South African Journal of Physiotherapy*, 69(1),1-10.

Mostert-Wentzel, K., Frantz, J. & van Rooijen, A.J. 2013b. A model for community physiotherapy from the perspective of newly graduated physiotherapists as a guide to

curriculum revision. *African Journal of Health Professions Educations*, Forthcoming June 2013.

Mostert-Wentzel, K., Masenyetse, L., Dinat, N., Botha, A., Jonkers, L. & Oosthuizen, L. 2012. Involvement in and views on social responsibility of members of the South African Society of Physiotherapy in Gauteng province, South Africa: A cross-sectional survey. *South African Journal of Physiotherapy*, 68(1),22-8.

Mothabeng, D.J. 2003. Research and the physiotherapy profession in South Africa. Reflections on a pilot study. *South African Journal of Physiotherapy*, 59(4),9-15.

Mouton, J. 2006. *How to succeed in your master's and doctoral studies: A South African guide and resource book*. Pretoria, RSA: Van Schaik.

Mowat, D. 2007. *Evidence-based decision-making in public health*. Ottawa, Canada: Public Health Agency of Canada.

Mpofu, R. & Imalingat, A. 2006. The development of an instrument for assessing community-based education of undergraduate students of Community and Health Sciences at the University of the Western Cape. *Education for Health*, 19(2),166-78.

Mpofu, R. 1995. Community-based rehabilitation: A way forward in Africa. *South African Journal of Physiotherapy*, 51(3),39-41.

Muller, J.H., Jain, S., Loeser, H. & Irby, D.M. 2008. Lessons learned about integrating a medical school curriculum: Perceptions of students, faculty and curriculum leaders. *Medical Education*, 42(8),778-5.

Munneke, M., Nijkrake, M.J., Keus, S.H., Kwakkel, G., Berendse, H.W., Roos, R.A., et al. 2010. Efficacy of community-based physiotherapy networks for patients with Parkinson's disease: A cluster-randomised trial. *The Lancet Neurology*, 9(1),46-54.

Munten, A.J.M. 2012. *Implementation of evidence based practice in mental health nursing: An action research study [thesis]*. The Netherlands: Tilberg University.

- Munten, G., van Den Bogaard, J., Cox, K., Garretsen, H. & Bongers, I. 2010. Implementation of evidence-based practice in nursing using action research: A review. *Worldviews on Evidence-Based Nursing*, 7(3),135-57.
- Myezwa, H. 2010. Mainstreaming HIV/AIDS in physiotherapy education and practice [thesis]. University of the Witwatersrand, Johannesburg, Republic of South Africa.
- Nabulsi, M., Harris, J., Letelier, L., Ramos, K., Hopayian, K., Parkin, C., et al. 2007. Effectiveness of education in evidence-based healthcare: The current state of outcome assessments and a framework for future evaluations. *International Journal of Evidence-Based Healthcare*, 5(4),468-76.
- Naidoo, J. & Wills, J. 2009. *Foundations for health promotion*, 3rd ed. Edinburgh: Baillière Tindall/Elsevier.
- Naidoo, S. & Chikte, U. 2002. Community dental service: The first year. *South African Dental Journal*, 57(5),193-6.
- Nastasi, B.K., Hitchcock, J., Sarkar, S., Burkholder, G., Varjas, K. & Jayasena, A. 2007. Mixed methods in intervention research: Theory to adaptation. *Journal of Mixed Methods Research*, 1(2),164-82.
- Nastasi, B.K., Hitchcock, J.H. & Brown, L.M. 2010. An inclusive framework for conceptualizing mixed methods design typologies: Moving towards fully integrated synergistic research models. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook for mixed methods in social and behavioral science research*. Thousand Oaks, CA: Sage. 68-70 p.
- Nathoo, A.N., Goldhoff, P. & Quattrochi, J.J. 2005. Evaluation of an interactive case-based online network (ICON) in a problem based learning environment. *Advances in Health Sciences Education*, 10(3),215-30.
- National Department of Health 2002a. *District hospital package: A set of norms and standards*. Pretoria, RSA: National Department of Health.

National Department of Health 2003. Free health care for disabled people at hospital level: Fact Sheet [Internet]. Pretoria, RSA: National Department of Health. [cited 2009 Oct 29]. Available from: <http://www.doh.gov.za/docs/factsheets/guidelines/disabled.pdf>

National Department of Health 2004. Transformation of the health care system: Decentralise to district level. Pretoria, RSA: National Department of Health.

National Department of Health 2005c. Service package guidelines for home and community-based care and support and the role of community care workers. Pretoria, RSA: National Department of Health.

National Department of Health 2007a. Infant and young child feeding policy. Pretoria, RSA: National Department of Health.

National Department of Health 2008b. Policy guidelines for child and adolescent mental health. Pretoria, RSA: National Department of Health.

National Department of Health 2008c. Policy and guidelines for the implementation of the Prevention of Mother to Child Transfer of HIV Programme. Pretoria, RSA: National Department of Health.

National Department of Health 2009a. Government's Programme of Action 2009 Human Development Cluster: Health. Pretoria, RSA: National Department of Health.

National Department of Health 2011b. Human Resources for Health RSA: HRH strategy for the health sector: 2012/13 – 2016/17.

National Department of Health 2011c. National strategic plan on HIV, STDs and TB 2012-2016. Pretoria, RSA: National Department of Health.

National Department of Health 2011d. District health information system: A long and healthy life for all South Africans. Pretoria, RSA: National Department of Health.

National Department of Health 2012a. Strategic plan for maternal, newborn, child and women's health (MNCWH) and nutrition in South Africa: 2012-2016. Pretoria, RSA: National Department of Health.

National Department of Health 2012d. South Africa's national strategic plan for a campaign on accelerated reduction of maternal and child mortality in Africa (CARMMA). "South Africa cares: No woman should die while giving life". Pretoria, RSA: National Department of Health.

National Department of Health 2012e. eHealth strategy South Africa: 2012-2016. A long and healthy life for all South Africans. Pretoria, RSA: National Department of Health.

National Department of Health c. 2011. Ward based primary health care teams: Implementation toolkit [Internet]. Pretoria, RSA: National Department of Health. [cited 2013 Feb 3]. Available from: <http://0-www.cmt.org.za.innopac.up.ac.za/wp-content/uploads/2011/09/PHC-OUTREACH-TEAM-Toolkit.pdf>

National Department of Health Ministerial Task Team 2012. District clinical specialist teams in South Africa: Ministerial task team report to the honourable Minister of Health Dr Aaron Motsoaledi. Pretoria, RSA: National Department of Health.

National Department of Health. 1976. Expanded scope of practice. Regulations in terms of section 33(1) of the Medical, Dental and Supplementary Health Service Professions Act Act 56 of 1976.

National Department of Health. 2000. National Rehabilitation Policy. Pretoria, RSA: National Department of Health.

National Department of Health. 2001. Policy guideline for youth and adolescent health. Pretoria, RSA: National Department of Health.

National Department of Health. 2002b. Report of community service ratification meeting held in Pretoria, Burgers Park Hotel. Pretoria, RSA; 27 September 2002.

National Department of Health. 2005a. National guideline on primary prevention of chronic disease of lifestyle (CDL). Pretoria, RSA.: National Department of Health.

National Department of Health. 2005b. National guideline on home-based care/community-based care. Pretoria, RSA: Department of Health.

National Department of Health. 2007b. Quality in health care. Pretoria, RSA: National Department of Health.

National Department of Health. 2008a. The Birchwood national consultative health forum declaration on primary health care. Recommitment to primary health care (PHC). Pretoria, RSA: National Department of Health.

National Department of Health. 2009b. Primary health care supervision manual: A guide to primary health care facility supervision. Pretoria, RSA: National National Department of Health.

National Department of Health. 2011a. National core standards for health establishments in South Africa: Towards quality care for patients. Pretoria, RSA: National National Department of Health.

National Department of Health. 2012b. The aid effectiveness framework for health in South Africa: Working together to implement the Negotiated Service Delivery Agreement and to attain the Millennium Development Goals. Pretoria, RSA: National Department of Health.

National Department of Health. 2012c. Integrated school health policy. Pretoria, RSA: National Department of Health.

National Physiotherapy Advice Committee 2010. Essential competency profile for physical rehabilitation therapists in Québec [Internet]. [Ordre professionnel de la physiothérapie du Québec]. [cited 2012 Jul 10]. Available from: <http://oppq.gc.ca/centre-documentation/?s=Competency+profile>

Nebot, M., Cabezas, C., Marques, F., Bimbela, J.L., Robledo, T., Megido, X., et al. 2007. Priorities in health promotion according to primary care health professionals: A Delphi study. *Atencion Primaria/Sociedad Espanola de Medicina de Familia y Comunitaria*, 39(6),285-8.

Neuendorf, K.A. 2002. The content analysis guidebook. Thousand Oaks, CA: Sage.

- Nicklin, W., Mass, H., Affonso, D.D., O'Connor, P., Ferguson-Paré, M., Jeffs, L., et al. 2004. Patient safety culture and leadership within Canada's academic health science centres: Towards the development of a collaborative position paper. *Nursing Leadership*, 17(1),22-34.
- Nies, M.A. & McEwen, M. 2007. *Community/public health nursing: Promoting the health of populations*. 4th ed. Edinburgh: Elsevier Saunders.
- Nigenda, G. & Machado, M.H. 2000. From state to market: The Nicaraguan labour market for health personnel. *Health Policy and Planning*, 15(3),312-8.
- Nochajski, S. & Matteliano, M. 2008. *A guide to cultural competence in the curriculum: Occupational therapy*. Buffalo, NY: Center for International Rehabilitation Research Information and Exchange.
- Nokes, K.M., Nickitas, D.M., Keida, R. & Neville, S. 2005. Does service-learning increase cultural competency, critical thinking, and civic engagement? *Journal of Nursing Education*, 44(2),65-70.
- Norcini, J. & Burch, V. 2007. Workplace-based assessment as an educational tool: AMEE Guide No. 31. *Medical Teacher*, 29(9-10),855-71.
- Norcini, J.J. & McKinley, D.W. 2007. Assessment methods in medical education. *Teaching and Teacher Education*, 23(3),239-50.
- Norcini, J.J. 2005. The Mini Clinical Evaluation Exercise (mini-CEX). *The Clinical Teacher*, 2(1),25-30.
- Novick, L.F. 2003. Introducing a case-based teaching intervention in preventive medicine education. *American Journal of Preventive Medicine*, 24(4, Suppl),S83-4.
- Novick, L.F., Lazorick, S., Clay, M.C., Merricks, P.A., Daugherty, J.C. & Efird, J.T. 2011. Using clinical skills exams to evaluate medical student skills in prevention. *American Journal of Preventive Medicine*, 41(4 Suppl),S181-6.

- Novick, L.F., Sutphen, S.M. & Wabrek, A. [n.d]. Preventive medicine handbook [Internet]. New York: Upstate Medical University. [cited 2012 Dec 13]. Available from: [www.upstate.edu/publichealth/education/preventive/handbook.pdf](http://www.upstate.edu/publichealth/education/preventive/handbook.pdf)
- Novick, L.F., Wojtowycz, M., Morrow, C.B. & Sutphen, S.M. 2003. Bicycle helmet effectiveness in preventing injury and death. *American Journal of Preventive Medicine*, 24(4, Suppl),S143-9.
- Noy, C. 2008. Sampling knowledge: The hermeneutics of snowball sampling in qualitative research. *International Journal of Social Research Methodology*, [Internet] 11(4),327-44 [<http://dx.doi.org/10.1080/13645570701401305>]
- Oandasan, I. 2011. Advancing Canada's family medicine curriculum: Triple C. *Canadian Family Physician*, 57(6),739-40.
- O'Cathian, A., Murphy, E. & Nicholl, J. 2007. Why, and how, mixed methods research is undertaken in health services research in England: A mixed methods study [Internet]. *BMC Health Services Research*, 7(1),85. [<http://dx.doi.org/10.1186/1472-6963-7-85>]
- Odawara, E. 2005. Cultural competency in occupational therapy: Beyond a cross-cultural view of practice. *American Journal of Occupational Therapy*, 59(3),325-34.
- Ohmer, M.L. & Korr, W.S. 2006. The effectiveness of community practice interventions: A review of the literature. *Research on Social Work Practice*, 16(2),132-45.
- Okoli, C. & Pawlowski, S.D. 2004. The Delphi method as a research tool: An example, design considerations and applications. *Information and Management*, 42(1),15-29.
- Oliver, R., Kersten, H., Vinkka-Puhakka, H., Alpasan, G., Bearn, D., Cema, I., et al. 2008. Curriculum structure: Principles and strategy. *European Journal of Dental Education*, 12(s1),S74-84.
- O'Loughlin, K., Dal Bello-Haas, V. & Milidonis, M. 2005. The Professional Development Plan: Cultivation of professional development and lifelong learning in professional (entry-level) physical therapist students. *Journal of Physical Therapy Education*, 19(2),42-51.



- Omondi, D., Walingo, G., Mbagaya, G. & Othuon, L. 2012. Predicting dietary practice behavior among type 2 diabetics using the theory of planned behavior and mixed methods design. *International Journal of Biological and Life Sciences*, 117-25.
- O'Neil, M.E., Rubertone, P.P. & Villanueva, A.M. 2007. Community experiential learning opportunities in the Drexel University Professional Doctor of Physical Therapy Program. *Journal of Physical Therapy Education*, 21(2),66-72.
- Onwuegbuzie, A.J. & Collins, K.M.T. 2007. A typology of mixed methods sampling designs in social science research. *The Qualitative Report*, 12(2),281-316.
- Onwuegbuzie, A.J. & Johnson, R.B. 2006. The validity issue in mixed research. *Research in the Schools*, 13(1),48-63.
- Onwuegbuzie, A.J. & Leech, N.L. 2005. On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology*, 8(5),375-87.
- Onwuegbuzie, A.J. & Leech, N.L. 2007. Validity and qualitative research: An oxymoron? *Quality and Quantity*, 41(2),233-49.
- Onwuegbuzie, A.J., Bustamante, R.M. & Nelson, J.A. 2010. Mixed research as a tool for developing quantitative instruments. *Journal of Mixed Methods Research*, 4(1),56-78.
- Onwuegbuzie, A.J., Johnson, R.B. & Collins, K.M.T. 2011. Assessing legitimation in mixed research: A new framework. *Quality and Quantity*, 45(6),1253-71.
- Opie, J. & Taylor, M.C. 2008. An exploratory Delphi study on the integration of disabled students into physiotherapy education. *Physiotherapy*, 94(4),292-9.
- Oppewal, S., Lamanna, B.F. & Lee Glenn, L. 2006. Comparison of the dissemination and implementation of standardized public health nursing competencies in academic and practice settings. *Public Health Nursing*, 23(2),99-107.

- Orpen, N. & Harris, J. 2010. Patients' perceptions of preoperative home-based occupational therapy and/or physiotherapy interventions prior to total hip replacement. *British Journal of Occupational Therapy*, 73(10),461-69.
- O'Shaughnessy, D.F. & Tilki, M. 2007. Cultural competency in physiotherapy: A model for training. *Physiotherapy*, 93(1),69-77.
- O'Shea, S.D., Taylor, N.F. & Paratz, J.D. 2007. A predominantly home-based progressive resistance exercise program increases knee extensor strength in the short-term in people with chronic obstructive pulmonary disease: A randomised controlled trial. *Australian Journal of Physiotherapy*, 53(4),229-37.
- Osman, A., Wardle, A. & Caesar, R. 2012. Online professionalism and Facebook: Falling through the generation gap. *Medical Teacher*, 34(8),549-56.
- Östlund, U., Kidd, L., Wengström, Y. & Rowa-Dewar, N. 2011. Combining qualitative and quantitative research within mixed method research designs: A methodological review. *International Journal of Nursing Studies*, 48(3),369.
- O'Sullivan, H., van Mook, W., Fewtrell, R. & Wass, V. 2012. Integrating professionalism into the curriculum: AMEE Guide No. 61. *Medical Teacher*, 34(2),e64-77.
- O'Sullivan, P., Aronson, L., Chittenden, E., Niehaus, B. & Learman, L. c.2011. Reflective ability rubric and user guide. MedEdPORTAL: ID 8133. [cited 2013 Jun 24]. Available from: [www.mededportal.org](http://www.mededportal.org).
- Ouzts, K.N., Brown, J.W. & Diaz Swearingen, C.A. 2006. Developing public health competence among RN-to-BSN students in a rural community. *Public Health Nursing*, 23(2),178-82.
- Pang, M.Y., Eng, J.J., Dawson, A.S., McKay, H.A. & Harris, J.E. 2005. A Community-based fitness and mobility exercise program for older adults with chronic stroke: A randomized controlled trial. *Journal of the American Geriatrics Society*, 53(10),1667-74.

- Panzarella, K.J. 2009. Beginning with the end in mind: Evaluating outcomes of cultural competence instruction in a doctor of physical therapy programme. *Disability & Rehabilitation*, 31(14),1144-52.
- Papadopoulos, I. & Lees, S. 2002. Developing culturally competent researchers. *Journal of Advanced Nursing*, 37(3),258-64.
- Papadopoulos, I., Tilki, M. & Taylor, G. 1998. *Transcultural care: A guide for health care professionals*. Wiltshire: Quay Books. In: O'Shaughnessy, D.F. & Tilki, M. 2007. Cultural competency in physiotherapy: A model for training. *Physiotherapy*, 93(1), 69-77.
- Park, J., Woodrow, S.I., Reznick, R.K., Beales, J. & MacRae, H.M. 2010. Observation, reflection, and reinforcement: Surgery faculty members' and residents' perceptions of how they learned professionalism [Internet]. *Academic Medicine*, 85(1),134. [<http://dx.doi.org/10.1097/ACM.0b013e3181c47b25>]
- Parmelee, D., Michaelsen, L.K., Cook, S. & Hudes, P.D. 2012. Team-based learning: A practical guide: AMEE Guide No. 65. *Medical Teacher*, 34(5),e275-87.
- Parry, R.H. & Brown, K. 2009. Teaching and learning communication skills in physiotherapy: What is done and how should it be done? *Physiotherapy*, 95(4),294-301.
- Passmore, P.R. & Kailis, S.G. 1994. In pursuit of rational drug use and effective drug management: Clinical and public health pharmacy viewpoint. *Asia-Pacific Journal of Public Health*, 7(4),236-41.
- Patel, V., Yoskowitz, N. & Arocha, J. 2009. Towards effective evaluation and reform in medical education: A cognitive and learning sciences perspective. *Advances in Health Sciences Education*, 14(5),791-812.
- Paterson, M., Green, M. & Maunder, E.M.W. 2007. Running before we walk: How can we maximise the benefits from community service dietitians in KwaZulu-Natal, South Africa? *Health Policy*, 82(3),288-301.

Pellegrino, J.W. & Hilton, M.L. 2012. Education for life and work: Developing transferable knowledge and skills in the 21<sup>st</sup> century. Washington, DC: National Research Council.

Penn, C., Mupawose, A. & Stein, J. 2009. From pillars to posts: Some reflections on community service six years on. *South African Journal of Communication Disorders*, 56(1),8-16.

Pereira, M.A., Kriska, A.M., Day, R.D., Cauley, J.A., LaPorte, R.E. & Kuller, L.H. 1998. A randomized walking trial in postmenopausal women: Effects on physical activity and health 10 years later. *Archives of Internal Medicine*, 158(15),1695-701  
Petros, S.G. 2012. Use of a mixed methods approach to investigate the support needs of older caregivers to family members affected by HIV and AIDS in South Africa. *Journal of Mixed Methods Research*, 6(4),275-93.

Peytchev, A., Couper, M.P., McCabe, S.E. & Crawford, S.D. 2006. Web survey design: Paging versus scrolling. *Public Opinion Quarterly*, 70(4),596-607.

Pharmaceutical Society of Australia [Internet]. 2003. Competency standards for pharmacists in Australia. Canberra: PSA. [updated 2013; cited 2011 March 10]. Available from: <http://www.psa.org.au/site.php?id=643>

Pillay, R. 2010. Towards a competency-based framework for nursing management education. *International Journal of Nursing Practice*, 16(6),545-54.

Pillow, W. 2003. Confession, catharsis, or cure? Rethinking the uses of reflexivity as methodological power in qualitative research. *International Journal of Qualitative Studies in Education*, 16(2),175-96.

Pinar, W.F. 2005. The problem with curriculum and pedagogy. *Journal of Curriculum and Pedagogy*, 2(1),67-82.

Plano Clark, V.L. & Badiie, M. 2010. Research questions in mixed methods research. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of mixed methods in behavioral and social research*. Thousand Oaks, CA: Sage. 275-304 p.

- Plano Clark, V.L. & Creswell, J.W. 2008. The mixed methods reader. Los Angeles, CA: Sage.
- Policy and Co-ordination and Advisory Service: Social Sector 2010. A nation in the making: A discussion document on macro-social trends in South Africa. Pretoria, RSA: The Presidency
- Polit, D.F.K.i.B. & Beck, C.T. 2006. Essentials of nursing research: Methods, appraisal, and utilization. 6<sup>th</sup> ed. Philadelphia: Lippincott Williams and Wilkins.
- Polivka, B.J., Stanley, S.A., Gordon, D., Taulbee, K., Kieffer, G. & McCorkle, S.M. 2008. Public health nursing competencies for public health surge events. *Public Health Nursing*, 25(2),159-65.
- Ponterotto, J.G. 2005. Qualitative research in counseling psychology: A primer on research paradigms and philosophy of science [Internet]. *Journal of Counseling Psychology*, 52(2),126. [http://dx.doi.org/10.1037/0022-0167.52.2.126]
- Pope, C. 2007. Synthesizing qualitative and quantitative health evidence: A guide to methods. Maidenhead, England: Open University Press, McGraw Hill Education.
- Potomková, J., Mihál, V. & Schwarz, D. 2012. Medical education for YouTube generation [Internet]. In: Kofuji S (ed). Croatia: InTech Open Science Europe. [cited 2013 Jan 03]. Available from: <http://www.intechopen.com/books/e-learning-engineering-on-job-training-andinteractive-teaching/medical-education-for-youtube-generation>
- Powell, C. 2003. The Delphi technique: Myths and realities. *Journal of Nursing*, 41(4),376-82.
- Prasad, S.A., Main, E., Dodd, M.E. & Association of Chartered Physiotherapists. Que 2008. Finding consensus on the physiotherapy management of asymptomatic infants with cystic fibrosis. *Pediatric Pulmonology*, 43(3),236-44.
- Prevent Child Abuse America. 2006. Evidence-based practice (EBP): Literature review. Chicago: Prevent Child Abuse America.
- Prideaux, D. 2003. Curriculum design. ABC of learning and teaching in medicine series. *British Medical Journal*, 326,268-70.

Prideaux, D. 2007. Curriculum development in medical education: From acronyms to dynamism. *Teaching and Teacher Education*, 23(3),294-302.

Prideaux, D. 2009. Integrated learning. In Dent, J.A. and Harden R.M. 2009. *A practical guide for medical teachers*. 3rd ed. Edinburgh, UK: Elsevier. 181-6 p.

Prideaux, D., Worley, P. & Bligh, J. 2007. Symbiosis: A new model for clinical education. *The Clinical Teacher*, 4(4),209-12.

Proctor, P., Lake, D., Jewell, L., Racine, L., D'Eon, M. & Reeder, B. 2010. Influencing student beliefs about poverty and health through interprofessional community-based educational experiences. *Journal of Research in Interprofessional Practice and Education*, 1(2),145-58.

Purnell, L. 2002. The Purnell model for cultural competence. *Journal of Transcultural Nursing*, 13(3),193-6.

Putz, M. 2004. [Theoretisch-konzeptionelle Grundlagen und eine Analyse nachhaltiger Siedlungsentwicklung in der Metropolregion Munchen] [Internet]. [Hochschulschriften zur Nachhaltigkeit.] In: In Mehnen, N. Mose, I and Strijker D. 2012. The Delphi method as a useful tool to study governance and protected areas? [Internet]. *Landscape Research*. 12,1-18. [<http://dx.doi.org/10.1080/01426397.2012.690862>]

Queensland Health & Griffith University. 2006. Audit of the training and education needs of staff working in community based rehabilitation in Queensland. [Internet]. [cited 20 Oct 2011]. Available from: [http://www.health.qld.gov.au/qhcrwp/docs/comp\\_audit\\_summary.pdf](http://www.health.qld.gov.au/qhcrwp/docs/comp_audit_summary.pdf)

Ramklass, S.S. 2009a. Physiotherapists in under-resourced South African communities reflect on practice. *Health and Social Care in the Community*, 17(5),522-9.

Ramklass, S.S. 2009b. An investigation into the alignment of a South African physiotherapy curriculum and the expectations of the healthcare system. *Physiotherapy*, 95(3),216-23.

Ramklass, S.S. 2010. *The physiotherapy undergraduate curriculum: A case for professional development [thesis]*. Durban: University of Kwa-Zulu Natal.

- Ratima, M., Waetford, C. & Wikaire, E. 2006. Cultural competence for physiotherapists: Reducing inequalities in health between Maori and non-Maori. *New Zealand Journal of Physiotherapy*, 34(3),153-9.
- Rauscher, L. & Greenfield, B.H. 2009. Advancements in contemporary physical therapy research: Use of mixed methods designs. *Physical Therapy*, 89(1),91-100.
- Redman, R.W. & Clark, L. 2002. Service-learning as a model for integrating social justice in the nursing curriculum. *Journal of Nursing Education*, 41(10),446-9.
- Reed, J. 2007. *Appreciative inquiry: Research for change*. London: Sage.
- Registered Nurses' Association of Ontario 2007. *Healthy work environments: Best practice guidelines*. Toronto, Ontario: RNAO.
- Reid, S.J. 2001. Compulsory community service for doctors in South Africa: An evaluation of the first year. *South African Medical Journal*, 91(4),329-36.
- Republic of South Africa. 2008. *National Qualifications Framework Act 67 of 2008*. Pretoria: Government Printer.
- Republic of South Africa. Department of Health. Act 56 of 1976. PT/03 Notice R23013. Expanded scope of practice. Regulations in terms of section 33(1) of the Medical, Dental and Supplementary Health Service Professions Act.
- Richer, M., Ritchie, J. & Marchionni, C. 2009. 'If we can't do more, let's do it differently!': Using appreciative inquiry to promote innovative ideas for better health care work environments. *Journal of Nursing Management*, 17(8),947-55.
- Riegelman, R.K. & Garr, D.R. 2008. Evidence-based public health education as preparation for medical school. *Academic Medicine*, 83(4),321-6.
- Riegelman, R.K., Evans, C.H. & Garr, D.R. 2004. Why a Clinical Prevention and Population Health Curriculum Framework? *American Journal of Preventative Medicine*, 27(5),481.
- Ringsted, C., Hansen, T.L., Davis, D. & Scherpbier, A. 2006. Are some of the challenging aspects of the CanMEDS roles valid outside Canada? *Medical Education*, 40(8),807-15.

- Roberts, T.E. 2012. Delivering tomorrow's curriculum. *Medical Teacher*, 34(7),519-20.
- Robinson, A.J., Tanchuk, C.J. & Sullivan, T.M. 2012. Professionalism and occupational therapy: An exploration of faculty and students' perspectives. *Canadian Journal of Occupational Therapy*, 79(5),275-84.
- Robinson, K.L. & Elliott, S.J. 2000. The practice of community development approaches in heart health promotion. *Health Education Research*, 15(2),219-31.
- Rocco, T.S.R.T.S., Bliss, L.A.B.L.A., Gallagher, S.G.S., Pérez, A.P.A. & Prado, P. 2003. Taking the next step: Mixed methods research in organizational systems research in organizational systems. *Information Technology, Learning, and Performance Journal*, 21(1),19-29.
- Roche, A. & Coote, S. 2008. Focus group study of student physiotherapists' perceptions of reflection. *Medical Education*, 42(11),1064-170.
- Rodger, S.A., Webb, G., Devitt, L., Gilbert, J., Wrightson, P. & McMeeken, J. 2008. Clinical education and practice placements in the allied health professions: An international perspective. *Journal of Allied Health*, 37(1),53-62.
- Roe, K. 2009. Infusing public health education into the undergraduate curriculum. *Peer Review (Association of American Colleges and Universities)*, 2009(Summer),19-22.
- Rohan, D., Ahern, S. & Walsh, K. 2009. Defining an anaesthetic curriculum for medical undergraduates. A Delphi study. *Medical Teacher*, 31(1),e1-5.
- Rollnick, S., Mason, P. & Butler, C. 1999. *Health behavior change: A guide for practitioners* Edinburgh: Churchill Livingstone.
- Romanello, M. & Holtgreffe, K. 2009. Teaching for cultural competence in non-diverse environments [Internet]. *The Internet Journal of Allied Health Sciences and Practice*, 7(4). [cited 2013 Jan 12]. Available from: <http://ijahsp.nova.edu>
- Rosenberg, E. 2010. Health care across a language divide. *Patient Education and Counseling*, 81(2),147-7.



- Ross, S. & Loke, Y.K. 2010. Development of learning outcomes for an undergraduate prescribing curriculum: British Pharmacological Society prescribing initiative. *British Journal of Clinical Pharmacology*, 70(4),604-8.
- Rothman, J. 2000. Collaborative self-help community development. *Journal of Community Practice*, 7(2),89-105.
- Rothman, J. 2008. Multi modes of intervention at the macro level. *Journal of Community Practice*, 15(4),11-40.
- Rourke, J. & Frank, J.R. 2005. Implementing the CanMEDS™ physician roles in rural specialist education: The Multi-Specialty Community Training Network. *Education for Health*, 18(3),368-78.
- Rowe, M. 2012. The use of assisted performance within an online social network to develop reflective reasoning in undergraduate physiotherapy students. *Medical Teacher*, 34(7),e469-75.
- Rowe, M., Frantz, J. & Bozalek, V. 2012. The role of blended learning in the clinical education of healthcare students: A systematic review [Internet]. *Medical Teacher*, 34,e216–21 [<http://dx.doi.org/10.3109/0142159X.2012.642831>]
- Rudd, A.G., Wolfe, C.D., Tilling, K. & Beech, R. 1997. Randomised controlled trial to evaluate early discharge scheme for patients with stroke. *British Medical Journal*, 315(7115),1039-44.
- Rule, S. C. 2006. Community-based rehabilitation. In Watermeyer B., Swartz, L., Lorenzo, T., Schneider, M. & Priestly, M. eds. *Disability and social change: A South African agenda*. Pretoria, RSA: Human Sciences Research Council (HSRC). [cited 2010 Jan]. Available from: <<http://www.hsrcpress.ac.za/product.php?productid=2151&freedownload=1D>>
- Ruperto, N., Meiorin, S., Iusan, S.M., Ravelli, A., Pistorio, A. & Martini, A. 2008. Consensus procedures and their role in pediatric rheumatology. *Current Rheumatology Reports*, 10(2),142-6.

- Rust, G., Kondwani, K., Martinez, R., Dansie, R., Wong, W., Fry-Johnson, Y., et al. 2006. A crash-course in cultural competence. *Ethnicity and Disease*, 16(2 Suppl 3),S29-36.
- Ryan, J., Lyon, K., Webb, O.J., Eves, F.F. & Ryan, C.G. 2010. Promoting physical activity in a low socio-economic area: Results from an intervention targeting stair climbing [Abstract]. *Physiotherapy Research International*, 15(4),246.
- Rychetnik, L., Hawe, P., Waters, E., Barratt, A. & Frommer, M. 2004. A glossary for evidence based public health. *Journal of Epidemiology and Community Health*, 58(7),538-45.
- Saber, M. 2009. The logbook effect on clinical learning of interns in internal ward rotation in Shiraz University of Medical Sciences. *Journal of Medical Education*, 12(3, 4),61-5.
- Salas, E., DiazGranados, D., Klein, C., Burke, C.S., Stagl, K.C., Goodwin, G.F., et al. 2008. Does team training improve team performance? A meta-analysis. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 50(6),903-33.
- Saldaña, J. 2009. *The coding manual for qualitative researchers*. London: Sage.
- Saldaña, J. 2011. *Fundamentals of qualitative research*. Oxford: Oxford University Press.
- Saldaña, J. 2012. *The coding manual for qualitative researchers*. 2<sup>nd</sup> ed. London: Sage.
- Sale, J.E.M. & Brazil, K. 2004. A strategy to identify critical appraisal criteria for primary mixed-method studies. *Quality and Quantity*, 38(4),351-65.
- Sales, C.S. & Schlaff, A.L. 2010. Reforming medical education: A review and synthesis of five critiques of medical practice. *Social Science & Medicine*, 70(11),1665-8.
- Sammons, P. 2010. The contribution of mixed methods to recent research on educational effectiveness. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of social and behavioral research*. Thousand Oaks, CA: Sage.
- Sanchez-Mendiola, M. 2004. Evidence-based medicine teaching in the Mexican Army Medical School. *Medical Teacher*, 26(7),661-3.

- Sanchez-Mendiola, M., Kieffer-Escobar, L., Marin-Beltran, S., Downing, S. & Schwartz, A. 2012. Teaching of evidence-based medicine to medical students in Mexico: A randomized controlled trial [Internet]. *BMC Medical Education*, 12(1),107. [<http://dx.doi.org/10.1186/1472-6920-12-107>]
- Sandars, J. 2009. The use of reflection in medical education: AMEE guide no. 44. *Medical Teacher*, 31(8),685-95.
- Sandelowski, M., Voils, C.I., Leeman, J. & Crandell, J.L. 2012. Mapping the mixed methods. *Mixed research synthesis terrain. Journal of Mixed Methods Research*, 6(4),317-31.
- Scarpaci, J. 2007. Musing on professionalism. *Journal of Physical Therapy Education*, 21(3),3-5.
- Scheele, F., Teunissen, P., Luijk, S.V., Heineman, E., Fluit, L., Mulder, H., et al. 2008. Introducing competency-based postgraduate medical education in the Netherlands. *Medical Teacher*, 30(3),248-53.
- Schifferdecker, K.E. & Reed, V.A. 2009. Using mixed methods research in medical education: Basic guidelines for researchers. *Medical Education*, 43(7),637-44.
- Schim, S.M., Doorenbos, A., Benkert, R. & Miller, J. 2007. Culturally congruent care: Putting the puzzle together. *Journal of Transcultural Nursing*, 18(2),103-10.
- Schippers, M.C., Den Hartog, D.N., Koopman, P.L. & Wienk, J.A. 2003. Diversity and team outcomes: The moderating effects of outcome interdependence and group longevity and the mediating effect of reflexivity. *Journal of Organizational Behavior*, 24(6),779-802.
- Schneider, H., Hlophe, H. & van Rensburg, D. 2008. Community health workers and the response to HIV/AIDS in South Africa: Tensions and prospects. *Health Policy and Planning*, 23(3),179-87.
- Schneider, M. 2011. *Introduction to public health*. Boston, MA: Jones and Bartlett.
- Schön, D.A. 1983. *The reflective practitioner: How professionals think in action*. New York: Basic Books.

Schön, D.A. 1987. Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. 1<sup>st</sup> ed. San Francisco, CA: Jossey-Bass.

Schooley, S.E. 2012. Using appreciative inquiry to engage the citizenry: Four potential challenges for public administrators. *International Journal of Public Administration*, 35(5),340-51.

Schoonheim-Klein, M.E., Habets, L.L.M.H., Aartman, I.H.A., van der Vleuten, C.P., Hoogstraten, J. & van der Velden, U. 2006. Implementing an objective structured clinical examination (OSCE) in dental education: Effects on students' learning strategies. *European Journal of Dental Education*, 10(4),226-35.

Schuster, C., Butler, J., Andrews, B., Kischka, U. & Ettlin, T. 2009. Comparison of embedded and added motor imagery training in patients after stroke: Study protocol of a randomised controlled pilot trial using a mixed methods approach [Internet]. *Trials*, 10(1),97. [<http://dx.doi.org/10.1186/1745-6215-10-97>]

Schuwirth, L.W.T. & van der Vleuten, C.P.M. 2011. Programmatic assessment: From assessment of learning to assessment for learning. *Medical Teacher*, 33(6),478-85.

Seemungal, T.A.R. & Wedzicha, J.A. 2006. Integrated care: A new model for COPD management? *European Respiratory Journal*, 28(1),4-6.

Seright, T.J. 2011. Clinical decision-making of rural novice nurses [Internet]. *Rural and Remote Health*, 11(3),1726. [cited on 2012 March 05]. Available from: <http://www.rrh.org.au>

Shanafelt, T.D., Oreskovich, M.R., Dyrbye, L.N., Satele, D.V., Hanks, J.B., Sloan, J.A., et al. 2012. Avoiding burnout: The personal health habits and wellness practices of US surgeons. *Annals of Surgery*, 255(4),625-33.

Shanley, P.F. 2007. Viewpoint: Leaving the "empty glass" of problem-based learning behind: New assumptions and a revised model for case study in preclinical medical education. *Academic Medicine*, 82(5),479-85.

Shaw, J.A., Connelly, D.M. & Zecevic, A.A. 2010. Pragmatism in practice: Mixed methods research for physiotherapy. *Physiotherapy Theory and Practice*, 26(8),510-18.

Shediac-Rizkallah, M.C. & Bone, L.R. 1998. Planning for the sustainability of community-based health programs: Conceptual frameworks and future directions for research, practice and policy. *Health Education Research*, 13(1),87-108.

Sheehan, K.B. 2001. E-mail survey response rates: A review [Internet]. *Journal of Computer-Mediated Communication*, 6(2). [<http://dx.doi.org/10.1111/j.1083-6101.2001.tb00117.x>]

Shenton, A.K. 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, 22(2),63-75.

Sherbino, J. & Frank, J.R. 2011. *Educational design: A CanMEDS guide for health professions*. Ottawa, Ontario: Royal College of Physicians and Surgeons of Canada.

Sherbino, J., Frank, J.R., Flynn, L. & Snell, L. 2011. “Intrinsic Roles” rather than “armour”: Renaming the “non-medical expert roles” of the CanMEDS framework to match their intent. *Advances in Health Sciences Education*, 16(5),695-7.

Shiels, J., Wilkie, K., Bulley, C., Smith, S. & Salisbury, L. 2011. A mixed methods service evaluation of a pilot functional electrical stimulation clinic for the correction of dropped foot in patients with chronic stroke. *Primary Health Care Research & Development*, 12(03),187-99.

Shilton, T., Howat, P., James, R., Burke, L., Hutchins, C. & Woodman, R. 2008. Health promotion competencies for Australia 2001-5: Trends and their implications. *Promotion and Education*, 15(2),21-6.

Shirley, D., van der Ploeg, H.P. & Bauman, A.E. 2010. Physical activity promotion in the physical therapy setting: Perspectives from practitioners and students. *Physical Therapy*, 90(9),1311-22.

- Sizer, P.S., Jr., Felstehausen, V., Sawyer, S., Dornier, L., Matthews, P. & Cook, C. 2007. Eight critical skill sets required for manual therapy competency: A Delphi study and factor analysis of physical therapy educators of manual therapy. *Journal of Allied Health*, 36(1),30-40.
- Skulmoski, G.J., Hartman, F.T. & Krahn, J. 2007. The Delphi method for graduate research. *Journal of Information Technology Educaiton*, 6(2007),1-21.
- Slonim-Nevo, V. & Nevo, I. 2009. Conflicting findings in mixed methods research: An illustration from an Israeli study on immigration. *Journal of Mixed Methods Research*, 3(2),109-28.
- Smith, S. 2005. Encouraging the development of team working skills in physiotherapy students. *International Journal of Therapy & Rehabilitation*, 12(10),454-61.
- Smith, S., Molineux, M., Rowe, N. & Larkinson, L. 2006. Integrating medical humanities into physiotherapy and occupational therapy education. *International Journal of Therapy & Rehabilitation*, 13(9),421-7.
- Song, M., Sandelowski, M. & Happ, M.B. 2010. Current practices and emerging trends in conducting mixed methods intervention studies in the health sciences. In Tashakkori, A. and C. Teddlie, C. eds. *Sage handbook of mixed methods in behavioral and social sciences*. Thousand Oaks, CA: Sage. 725-48 p.
- South African Qualifications Authority. 2005a. Guidelines for integrated assessment. Pretoria, Republic of South Africa: South African Qualifications Authority.
- South African Qualifications Authority. 2005b. The National Qualifications Framework and curriculum development. Pretoria, Republic of South Africa: South African Qualifications Authority.
- South African Qualifications Authority. 2005c. Developing learning programmes for NQF-registered qualifications. A step-by-step guide. Pretoria, Republic of South Africa: South African Qualifications Authority.

Sox, H.C. 2002. Medical professionalism in the new millennium: A physician charter. *Annals of Internal Medicine*, 136(3),243-6.

Speech Pathology Australia [Internet]. 2001. Principles of practice. [updated 2012; cited 2012 Jul 20]. Available from: <http://www.speechpathologyaustralia.org.au/library/PrinciplesOfPractice.pdf>

Stainsby, K. & Bannigan, K. 2012. Reviewing work-based learning opportunities in the community for physiotherapy students: An action research study. *Journal of Further and Higher Education*, 36(4), 459-76.

Stefaniak, K. 2007. Discovering nursing excellence through appreciative inquiry. *Nurse Leader*, 5(2),42-6.

Stemler, S. 2001. An overview of content analysis. *Practical Assessment, Research and Evaluation*, 7(17),137-46.

Stenhouse, L. 1975. *An introduction to curriculum research and development*. London: Heineman. In: Knight, P.T. 2010. Complexity and curriculum: A process approach to curriculum-making. *Teaching in Higher Education*, 6(3),369-81.

Stephenson, K.S., Peloquin, S.M., Richmond, S.A., Hinman, M.R. & Christiansen, C.H. 2002. Changing educational paradigms to prepare allied health professionals for the 21<sup>st</sup> century. *Education for Health: Change in Learning and Practice*, 15(1),37-49.

Stephenson, R. & Richardson, B. 2008. Building an interprofessional curriculum framework for health: A paradigm for health function. *Advances in Health Sciences Education*, 13(4),547-57.

Stern, D.T., Wojtczak, A. & Schwarz, M.R. 2003. The assessment of global minimum essential requirements in medical education. *Medical Teacher*, 25(6),589-95.

Stevenson, K., Chadwick, A.V. & Hunter, S.M. 2004. National survey of lecturers/practitioners in physiotherapy. *Physiotherapy*, 90(3),139-44.

- Stewart, A. & Salmon, M. 1994. Physiotherapy graduates contribution to South Africa's health needs: A ten year survey of the University of the Witwatersrand. *South African Journal of Physiotherapy*, 50(3),62-73.
- Stewart, J. & Haswell, K. 2007. Primary health care in Aotearoa, New Zealand: Challenges and opportunities for physiotherapists. *New Zealand Journal of Physiotherapy*, 35(2),48-53.
- Stewart, J. 2001. Is the Delphi technique a qualitative method? *Medical Education*, 35(10),1365-2923.
- Stewart, M. 2002. Cultural competence in undergraduate healthcare education: Review of the issues. *Physiotherapy*, 88(10),620-9.
- Steyn, G.M. 2012. Reframing professional development for South African schools: An appreciative inquiry approach. *Education and Urban Society*, 44(3),318-41.
- Streiner, D.L. 2003. Starting at the beginning: An introduction to coefficient alpha and internal consistency. *Journal of Personality Assessment*, 80(1),99-103.
- Sullivan, W. & Rosin, M.S. 2008. A new agenda for higher education: Shaping a life of the mind for practice [Internet]. New York, USA: The Carnegie Foundation for the Advancement of Teaching. [cited 2009 Sep 02]. Available from: <http://www.carnegiefoundation.org/publications/index.asp?key=498>
- Sundelin, G. 2005. Public health and challenges for physiotherapy. *Advances in Physiotherapy*, 7(4),143-3.
- Svenberg, K., Wahlqvist, M. & Mattsson, B. 2007. "A memorable consultation": Writing reflective accounts articulates students' learning in general practice. *Scandinavian Journal of Primary Health Care*, 25(2),75-9.
- Swanepoel, H. & de Beer, F. 2006. [Community development: breaking the cycle of poverty.](#) Lansdowne, RSA: Juta.



- Tan, S.M., Ladyshevsky, R.K. & Gardner, P. 2010. Using blogging to promote clinical reasoning and metacognition in undergraduate physiotherapy fieldwork programs. *Australasian Journal of Educational Technology*, 26(3),355-68.
- Tapio, P. 2003. Disaggregative policy Delphi: Using cluster analysis as a tool for systematic scenario formation. *Technological Forecasting and Social Change*, 70(1),83-101.
- Tashakkori, A. & Creswell, J.W. 2007a. Editorial: The new era of mixed methods. *Journal of Mixed Methods Research*, 1(1),3-7.
- Tashakkori, A. & Creswell, J.W. 2007b. Editorial: Exploring the nature of research questions in mixed methods research. *Journal of Mixed Methods Research*, 1(3),207-11.
- Tashakkori, A. & Teddlie, C. 2010. *Sage handbook of mixed methods in social and behavioral research*. 2<sup>nd</sup> ed. Thousand Oaks, CA: Sage.
- Teddlie, C. & Tashakkori, A. 2009. *Foundations of mixed methods research: Integrating quantitative and qualitative techniques in the social and behavioral sciences*. London: Sage.
- Tekian, A. 1997. An application of the SPICES model to the status of medical curricula in the Eastern Mediterranean Region. *Medical Teacher*, 19(3),217-8.
- Ten Cate, O. & Scheele, F. 2007. Competency-based postgraduate training: Can we bridge the gap between theory and clinical practice? *82(6)*,542-47.
- Tesch, R. 1990. *Qualitative research: Analysis types and software tools*. 1<sup>st</sup> ed. London: RoutledgeFalmer.
- Tesch, R. 1995. *Qualitative research: Analysis types and software tools*. 2<sup>nd</sup> ed. London: RoutledgeFalmer.
- Teye, J.K. 2012. Benefits, challenges, and dynamism of positionalities associated with mixed methods research in developing countries: Evidence from Ghana. *Journal of Mixed Methods Research*, 6(4),379-91.
- The Physiotherapy Board of New Zealand. 2009. *Physiotherapy competencies for physiotherapy practice in New Zealand*. Wellington: The Physiotherapy Board of New Zealand.

The Presidency RSA & the United Nations Children's Fund 2009. Situation analysis of children in South Africa. Pretoria, RSA: The Presidency.

The Presidency RSA 2009. National youth policy 2009 to 2014 [Internet]. [cited 2013 Feb 02]. Available from: <http://www.thepresidency.gov.za/MediaLib/Downloads/Home/Publications/YouthPublications/NationalYouthPolicyPDF/NYP.pdf>

The Presidency RSA. 2008. Towards and anti-poverty strategy for South Africa: A discussion document. Pretoria, RSA: The Presidency.

The Presidency RSA. 2010. Social cohesion and social justice in South Africa. Pretoria, RSA: The Presidency.

The Presidency: National Planning Commission. 2010. Development indicators. Pretoria, RSA: National Planning Commission, NPC.

Therapy Project Office 2008. Physiotherapy competencies, Ireland: National Implementation Group for clinical placement for Occupational Therapy, Physiotherapy, and Speech and Language Therapy.

Thistlethwaite, J.E., Davies, D., Ekeocha, S., Kidd, J.M., MacDougall, C., Matthews, P., et al. 2012. The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME Guide No. 23. *Medical Teacher*, 34(6),421-44.

Thom, D.H., Tirado, M.D., Woon, T.L. & McBride, M.R. 2006. Development and evaluation of a cultural competency training curriculum [Internet]. *BMC Medical Education*, 2006(6),38. [<http://dx.doi.org/10.1186/1472-6920-6-38>]

Thomas, D.R. 2006. A general inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, 27(2),237-46.

Thomas, M.J., Simpson, J., Riley, R. & Grant, E. 2010. The impact of home-based physiotherapy interventions on breathlessness during activities of daily living in severe COPD: A systematic review. *Physiotherapy*, 96(2),108-19.

- Thomas, P. 2005. Disability, poverty and the millennium development goals: Relevance, challenges and opportunities for DFID. New York: Cornell University.
- Thomé, G., Hovenberg, H. & Edgren, G. 2006. Portfolio as a method for continuous assessment in an undergraduate health education programme. *Medical Teacher*, 28(6),171-6.
- Thornquist, E. 2008. Patient records: Physiotherapists' contributions. *Advances in Physiotherapy*, 10(1),31-40.
- Thurgood, M. 2009. Chronic pain: A community-based exercise and education program [thesis]. Kingston, Ontario, Canada: Queens University. [cited 2012 Nov 7]. Available from: <http://0-hdl.handle.net.innopac.up.ac.za/1974/5176>
- Thurmond, V.A. 2001. The point of triangulation. *Journal of Nursing Scholarship*, 33(3),253-8.
- Tiffin, P.A., Finn, G.M. & McLachlan, J.C. 2011. Evaluating professionalism in medical undergraduates using selected response questions: Findings from an item response modelling study [Internet]. *BMC Medical Education*, 11(1),43. [cited 2013 Jan 14]. Available from: <http://www.biomedcentral.com/1472-6920/11/43h>
- Tilson, J.K., Kaplan, S.L., Harris, J.L., Hutchinson, A., Ilic, D., Niederman, R., et al. 2011. Sicily statement on classification and development of evidence-based practice learning assessment tools [Internet]. *BMC Medical Education*, 11(1),78. [http://dx.doi.org/10.1186/1472-6920-11-78]
- Tongco, M.D.C. 2007. Purposive sampling as a tool for informant selection. *Ethnobotany Research and Applications*, 5(2007),147-58.
- Tourangeau, A.N.N., Cranley, L., Spence Laschinger, H.K. & Pachis, J. 2010. Relationships among leadership practices, work environments, staff communication and outcomes in long-term care. *Journal of Nursing Management*, 18(8),1060-72.

- Trevena, L.J. & Clarke, R.M. 2002. Self-directed learning in population health: A clinically relevant approach for medical students. *American Journal of Preventive Medicine*, 22(1),59-65.
- Trevena, L.J., Sainsbury, P., Henderson-Smart, C., Clarke, R., Rubin, G. & Cumming, R. 2005. Population health integration within a medical curriculum: An eight-part toolkit. *American Journal of Preventive Medicine*, 29(3),234-9.
- Tromp, F., Vernooij-Dassen, M., Kramer, A., Grol, R. & Bottema, B. 2010. Behavioural elements of professionalism: Assessment of a fundamental concept in medical care. *Medical Teacher*, 32(4),161-9.
- Trueit, D.L. 2005. *Complexifying the poetic: Toward a poiesis of curriculum* [thesis]. Louisiana State University and Agricultural and Mechanical College.
- Tsai, S.-L., Ho, M.-J., Hirsh, D. & Kern, D.E. 2012. Defiance, compliance, or alliance? How we developed a medical professionalism curriculum that deliberately connects to cultural context. *Medical Teacher*, 34(8),614-7.
- Tuhan, I. 2003. Mastering CanMEDS roles in psychiatric residency: A resident's perspective. *Canadian Journal of Psychiatry*, 48(4),222-4.
- Turner, S.R., White, J.S., Poth, C. & Rogers, W.T. 2012. Learning the CanMEDS roles in a near-peer shadowing program: A mixed methods randomized control trial. *Medical Teacher*, 34(11),888-92.
- Turunen, H., Tossavainen, K. & Vertio, H. 2004. How can critical incidents be used to describe health promotion in the Finnish European Network of Health Promoting Schools? *Health Promotion International*, 19(4),419-27.
- Umar MÉNdez, M.J., Armayor, N.C., Navarlaz, M.T.D. & Wakefield, A. 2008. The potential advantages and disadvantages of introducing interprofessional education in to the healthcare curricula in Spain. *Nurse Educ.Today*, 28(3),327-36.

University of British Columbia Department of Physiotherapy. n.d. Physiotherapy curriculum [Internet]. [cited 2011 Nov 7]. Available from: <http://www.wcpt.org/node/33154>

Ury, W.A., Arnold, R.M. & Tulsy, J.A. 2002. Palliative care curriculum development: A model for a content and process-based approach. *Journal of Palliative Medicine*, 5(4),539-48.

Uys, L.R. & Gwele, N.S. 2005. Curriculum development in nursing: Process and innovation. London: Routledge.

Valani, R.A., Yanchar, N., Grant, V. & Hancock, B.J. 2010. The development of a national pediatric trauma curriculum. *Medical Teacher*, 32(3),e115-9.

Van den Berg, H. 2004. Rating of SPICES criteria to evaluate and compare curricula. *Medical Teacher*, 26(4),381-3.

Van der Haar, D. & Hosking, D.M. 2004. Evaluating appreciative inquiry: A relational constructionist perspective. *Human Relations*, 57(8),1017-36.

Van Mook, W.N., van Luijk, S.J., O'Sullivan, H., Wass, V., Harm Zwaveling, J., Schuwirth, L.W., et al. 2009a. The concepts of professionalism and professional behaviour: Conflicts in both definition and learning outcomes. *European Journal of Internal Medicine*, 20(4),e85-9.

Van Mook, W.N.K.A., Gorter, S.L., O'Sullivan, H., Wass, V., Schuwirth, L.W. & van der Vleuten, C.P.M. 2009b. Approaches to professional behaviour assessment: Tools in the professionalism toolbox. *European Journal of Internal Medicine*, 20(8),e153-7.

Van Mook, W.N.K.A., van Luijk, S.J., de Grave, W., O'Sullivan, H., Wass, V., Schuwirth, L.W., et al. 2009c. Teaching and learning professional behavior in practice. *European Journal of Internal Medicine*, 20(5),e105-11.

Van Ness, P.H., Fried, T.R. & Gill, T.M. 2011. Mixed methods for the interpretation of longitudinal gerontologic data: Insights from philosophical hermeneutics. *Journal of Mixed Methods Research*, 5(4),293-308.

Van Oosten, E.B. 2006. Intentional change theory at the organizational level: A case study. *Journal of Management Development*, 25(7),707-17.

- Van Tartwijk, J. & Driessen, E.W. 2009. Portfolios for assessment and learning: AMEE Guide no. 45. *Medical Teacher*, 31(9),790-801.
- Van Tartwijk, J., Driessen, E., Van, d.V. & Stokking, K. 2007. Factors influencing the introduction of portfolios. *Quality in Higher Education*, 13(1),69-79.
- Vélez Ortiz, D., Sosulski, M.R. & Sherwood, D.A. 2012. Competently mixing: Does a clinical practice cultural competence framework fit in mixed methods research? *Journal of Mixed Methods Research*, 6(4),348-63.
- Ventegodt, S., Morad, M. & Merrick, J. 2004. Clinical holistic medicine: Holistic pelvic examination and holistic treatment of infertility. *TheScientificWorldJournal*, 4(2004),148-58.
- Verma, S., Broers, T., Paterson, M., Schroder, C., Medves, J.M. & Morrison, C. 2009. Core competencies: The next generation. Comparison of a common framework for multiple professions. *Journal of Allied Health*, 38(1),47-53.
- Verma, S., Flynn, L. & Seguin, R. 2005. Faculty's and residents' perceptions of teaching and evaluating the role of health advocate: A study at one Canadian university. *Academic Medicine*, 80(1),103-8.
- Visser, J., Marais, M., du Plessis, J., Steenkamp, I. & Troskie, I. 2006. Experiences and attitudes of dieticians during the first compulsory community service year (2003). *South African Journal of Clinical Nutrition*, 19(1),10-17.
- Vlayen, J., Aertgeerts, B., Hannes, K., Sermeus, W. & Ramaekers, D. 2005. A systematic review of appraisal tools for clinical practice guidelines: Multiple similarities and one common deficit. *International Journal for Quality in Health Care*, 17(3),235-42.
- Voogt, J. & Roblin, N.P. 2012. 21<sup>st</sup> century skills: A discussion paper. Enschede, the Netherlands: University of Twente.
- Wakerman, J. & Humphreys, J.S. 2011. Sustainable primary health care services in rural and remote areas: Innovation and evidence. *Australian Journal of Rural Health*, 19(3),118-24.

- Wallner, P.J. & Stewart, A. 1994. A community approach to physiotherapy. *South African Journal of Physiotherapy*, 50(3),54-6.
- Wangler, M. 2009. Usefulness of CanMEDS competencies for chiropractic graduate education in Europe. *The Journal of Chiropractic Education*, 23(2),123-33.
- Ward, A. & Gracey, J. 2006. Reflective practice in physiotherapy curricula: A survey of UK university based professional practice coordinators. *Medical Teacher*, 28(1),e32-9.
- Webb, N.M. 1997. Assessing students in small collaborative groups. *Theory Into Practice*, 36(4),205-13.
- Weed, D.L. 2004. Precaution, prevention, and public health ethics. *Journal of Medicine and Philosophy*, 29(3),313-32.
- Wesselink, R., Dekker-Groen, A.M., Biemans, H.J.A. & Mulder, M. 2010. Using an instrument to analyse competence: A Delphi based study programmes. Experiences of teachers in Dutch vocational education and training. *Journal of Curriculum Studies*, 42(6),813-29.
- West, C. 2012. Empathy, distress and a new understanding of doctor professionalism. *Medical Education*, 46(3),238-44.
- West, C., Jaeger, T. & McDonald, F. 2011. Extended evaluation of a longitudinal medical school evidence-based medicine curriculum. *J Gen Intern Med*, 26(6),611-15.
- Whitcomb, M. 2005. Why we must teach evidence-based medicine. *Academic Medicine*, 80(1),1-2.
- White, M.D. & Marsh, E.E. 2006. Content analysis: A flexible methodology. *Library Trends*, 55(1),22-45.
- Whitehead, C., Austin, Z. & Hodges, B. 2011. Flower power: The armoured expert in the CanMEDS competency framework? *Advances in Health Sciences Education*, 16(5),681-94.
- Whitehead, D. 2008. An international Delphi study examining health promotion and health education in nursing practice, education and policy. *Journal of Clinical Nursing*, 17(7),891-900.

- Wilkinson, T.J., Wade, W.B. & Knock, L.D. 2009. A blueprint to assess professionalism: Results of a systematic review. *Academic Medicine*, 84(5),551-8.
- Williams, B., Onsman, A. & Brown, T. 2012. A Rasch and factor analysis of a paramedic graduate attribute scale. *Evaluation and the Health Professions*, 35(2),148-68.
- Williams, R.M. & Wessel, J. 2004. Reflective journal writing to obtain student feedback about their learning during the study of chronic musculoskeletal conditions. *Journal of Allied Health*, 33(1),17-23.
- Williams, R.M., Wessel, J., Gemus, M. & Foster-Seargeant, E. 2002. Journal writing to promote reflection by physical therapy students during clinical placements. *Physiotherapy Theory and Practice*, 18(1),5-15.
- Wilson, S., Eagles, J.M., Platt, J.E. & McKenzie, H. 2007. Core undergraduate psychiatry: What do non-specialists need to know? *Medical Education*, 41(7),698-702.
- Wilson, V. 2012. Research methods: Interviews. *Evidence Based Library and Information Practice*, 7(2),96-8.
- Wimmers, P.F. & Stuber, M.L. 2010. Assessing medical students' empathy and attitudes towards patient-centered care with an existing clinical performance exam (OSCE). *Innovation and Creativity in Education*, 2(2),1911-3.
- Windish, D.M., Price, E.G., Clever, S.L., Magaziner, J.L. & Thomas, P.A. 2005. Teaching medical students the important connection between communication and clinical reasoning. *Journal of General Internal Medicine*, 20(12),1108-13.
- Wolfe, C.D., Tilling, K. & Rudd, A.G. 2000. The effectiveness of community-based rehabilitation for stroke patients who remain at home: A pilot randomized trial. *Clinical Rehabilitation*, 14(6),563-9.
- Wong, A.K. 2006. Curriculum development in anesthesia: Basic theoretical principles. *Canadian journal of anaesthesia = Journal canadien d'anesthesie*, 53(9),950-60.



World Confederation for Physical Therapy. 2011a. Policy statement. Community based rehabilitation. London, UK: World Confederation for Physical Therapy.

World Confederation for Physical Therapy. 2011b. Policy statement: Education. London, UK: WCPT.

World Confederation for Physical Therapy. 2011c. WCPT guideline for physical therapist professional entry level education. London, UK: WCPT.

World Health Organization. 2001. International classification of functioning, disability and health. Geneva: World Health Organization.

World Health Organization. 2006a. The World Health report 2006: Working together for health. Geneva: World Health Organization.

World Health Organization. 2010. Towards reaching the health-related millennium development goals: Progress report and the way forward:. Geneva: World Health Organization.

World Health Organization. 2006b. Disability and rehabilitation WHO action plan 2006-2011. United Nations: World Health Organization.

World Health Organization. 1996. Doctors for health: A WHO global strategy for changing medical education and medical practice for health for all. Geneva: World Health Organization.

World Health Organization. 2008a. School policy framework: Implementation of the WHO global strategy on diet, physical activity and health. Geneva: World Health Organization.

World Health Organization. 2008b. Preventing noncommunicable diseases in the workplace through diet and physical activity WHO/World economic forum report of a joint event. Geneva: World Health Organization.

World Health Organization. 2009. Interventions on diet and physical activity: What works. Summary report. Geneva: World Health Organization.

World Health Organization/International Federation of Anti-Leprosy Associations. 2007. Technical guide on community-based rehabilitation and leprosy: Meeting the rehabilitation needs of people affected by leprosy and promoting quality of life. NLM classification: WC 335. Geneva: World Health Organization.

Writing@csu. 2012. Introduction to content analysis. Colorado: Colorado State University. [cited 2008 Sept 2]. Available from: <http://writing.colostate.edu/guides/page.cfm?pageid=1305>

Yauch, C.A. & Steudel, H.J. 2003. Complementary use of qualitative and quantitative cultural assessment methods. *Organizational Research Methods*, 6(4),465-81.

Yin, R.K. 2006. Mixed methods research: Are the methods genuinely integrated or merely parallel. *Research in the Schools*, 13(1),41-47.

Young, J.B. & Forster, A. 1991a. Methodology of a stroke rehabilitation trial. *Clinical Rehabilitation*, 5(2),127-33.

Young, J.B. & Forster, A. 1991b. The Bradford community stroke trial: Eight week results. *Clinical Rehabilitation*, 5(4),283-92.

Young, J.B. & Forster, A. 1992. The Bradford community stroke trial: Results at six months. *British Medical Journal*, 304(6834),1085-9.

Young, J.B. & Forster, A. 1993. Day hospital and home physiotherapy for stroke patients: A comparative cost-effectiveness study. *Royal College of Physicians of London Journal*, 27(3),252-8.

Young, R., Jones, D. & Baker, K. 2010. What makes an 'ideal' physiotherapy service for people with parkinson's disease? *Physiotherapy Research International*, 15(4),244-4.

Yousefi-Nooraie, R., Rashidian, A., Keating, J.L. & Schonstein, E. 2007. Teaching evidence-based practice: The teachers consider the content. *Journal of Evaluation in Clinical Practice*, 13(4),569-75.

Yousefy, A., Mosavi, A. & Shayan, S. 2012. Developing a clinical performance logbook for nursing students receiving cardiac care field training. *Journal of Education and Health Promotion*, 1(1),1-5.

Zaza, S., Briss, P., Harris, K.W. (eds) and the Task Force on Community Preventive Services. 2005. *The guide to community preventive programmes. Chapters 1, 2 and 5.* [Internet]. New York: Oxford University Press. [cited 2011 Dec 06] Available from: <http://www.thecommunityguide.org/library/book/index.html>.

Zenzano, T., Allan, J.D., Bigley, M.B., Bushardt, R.L., Garr, D.R., Johnson, K., et al. 2011. The roles of healthcare professionals in implementing clinical prevention and population health. *American Journal of Preventive Medicine*, 40(2),261-7.

Ziden, L., Frandin, K. & Kreuter, M. 2008. Home rehabilitation after hip fracture. A randomized controlled study on balance confidence, physical function and everyday activities. *Clinical Rehabilitation*, 22(12),1019-33.

## APPENDICES

## APPENDIX A. RISK OF BIAS TABLES – COCHRANE TOOL

In each case the primary study is listed first and secondary studies, e.g. those describing the methodology, are listed thereafter. Each study is followed by a table, which indicates the risk for each type of bias and the support for the judgement of bias as high or low.

Barrett, C. & Smerdely, P. 2002. A comparison of community-based resistance exercise and flexibility exercise for seniors. *Australian Journal of Physiotherapy*, 48(3),215-20.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“At a different time, another researcher allocated subjects to each group using a computer generated random number list (from a list of participants). Subjects were informed after allocation by letter or phone of the time and venue of their exercise class. The last participant to be allocated was allocated to the flexibility group to ensure equal numbers.” (p. 215)</p> <p>“There were no differences in sex distribution, age, and height and medication number between the groups. Only SF36 vitality (<math>p &lt; 0.003</math>) was significantly better in the flexibility group than the progressive resistance training group.” (p. 217)</p> <p>Comment: The difference in SP36 scores is a bias against the experimental group for doing better.</p>
Allocation concealment (selection bias)	Low risk	<p>“At a different time, another researcher allocated subjects to each group using a computer generated random number list (from a list of participants). Subjects were informed after allocation by letter or phone of the time and venue of their exercise class.” (p. 215)</p>
Blinding of participants and personnel (performance bias)	Low risk	<p>“Subjects attended an information session where they were informed that the exercise programs were part of a research program but were not given specific information about differences in content by the assessor.”(p. 215)</p>

Entry	Judgement	Support for judgement
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	“The assessor was blinded to the group allocation and class times and the allocation process was concealed.” (p. 215)
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	Low risk	<p>“Data have been included on an intention-to-treat basis.” (p. 216)</p> <p>“Of the 44 subjects initially assessed, two subjects from the progressive resistance training group and two from the flexibility group dropped out during the study. Reasons for dropping out were aggravation of osteoarthritic knees (n = 2 from progressive resistance training group), transport difficulties (n = 1) and other commitments (n = 1). The rate of return of SF36 surveys was 100% from those completing the program.” (p. 217)</p> <p>Comment: The data of those who did not complete the trial were used in analysis and they completed the final Quality of Life (QoL) measure. Therefore no attrition.</p>
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	N/A	N/A
Selective reporting (reporting bias)	Unclear	Wrote to the authors to find out if the proposal had been published. Did not receive an answer.

Beech, R., Rudd, A.G., Tilling, K. & Wolfe, C.D. 1999. Economic consequences of early inpatient discharge to community-based rehabilitation for stroke in an inner-London teaching hospital. *Stroke*, 30(4),729-35.

Rudd, A.G., Wolfe, C.D., Tilling, K. & Beech, R. 1997. Randomised controlled trial to evaluate early discharge scheme for patients with stroke. *British Medical Journal*, 315(7115),1039-44.

Wolfe, C.D., Tilling, K. & Rudd, A.G. 2000. The effectiveness of community-based rehabilitation for stroke patients who remain at home: A pilot randomized trial. *Clinical Rehabilitation*, 14(6),563-9.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Quote: "...methods of case ascertainment and randomization, and clinical results of the trial have been fully reported elsewhere."  "After consent randomisation was restricted in permuted blocks of 10 with random number tables provided in blank sealed opaque envelopes." (Rudd 1997: 1040)  Comment: No statistical differences in baseline data See Table 2 (Rudd 1997).
Allocation concealment (selection bias)	Low risk	"After consent randomisation was restricted in permuted blocks of 10 with random number tables provided in blank sealed opaque envelopes." (Rudd 1997: 1040)
Blinding of participants and personnel (performance bias)	High risk	Quote: None  Comment: Patients and personnel were aware of the group they were allocated to and both groups had separate caregivers who knew which group they were caring for.



Entry	Judgement	Support for judgement
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	High risk	Comment: Probably not done. There was no mention of assessor blinding in the study. "Baseline data were collected after randomisation by a researcher blinded to which arm of the trial the patient was in." (Rudd 1997: 1039, 40)
Blinding of outcome assessment (detection bias) (objective outcomes)	Low risk	"Two research associates conducted all the assessments at discharge and at 2, 4, and 6 months. A third research associate conducted the assessment at 12 months by interview, usually in the patient's home, and she was blind to the treatment group, although occasionally the patient did make clear which group they had been in. No evaluation of the efficacy of the blinding procedure was performed." (Rudd 1997: 1040)
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	Low risk  N/A	"Analysis of outcomes focused on differences at 12 months after randomization."  Comment: Data described were all over a 12-month period for both groups.  Comment: No short-term follow-up.
Incomplete outcome data addressed (attrition bias), longer-term outcomes (follow-up at 2, 4, 6 weeks, and 12 months after randomization" (Rudd: 1039))	Low risk	See tables 2 to 4.  "Table 4 gives the number of patients lost to follow up, survival to one year, recurrence of stroke, and readmission rates. Five patients in the community therapy group were lost to follow up due to refusal to participate further and emigration. Four of the conventional treatment group were lost to follow up at 1 year. No differences in mortality between the groups were observed." (Rudd 1997: 142)  Comment: Table 4: Followed up 136 of 167 (81%) and 126 of 164 (77%) (Rudd).

Entry	Judgement	Support for judgement
		Analysis for the same number of subjects at baseline allocated to the study.
Selective reporting (reporting bias)	Unclear	Results were given for all the variables described in the method.  However, did not have the original protocol.

Barnett, A., Smith, B., Lord, S.R., Williams, M. & Baumann, A. 2003. Community-based group exercise improves balance and reduces falls in at-risk older people: A randomised controlled trial. *Age and Ageing*, 32(4),407-14.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“The subjects were randomised in matched blocks (n=6) after the baseline assessment using consecutively numbered opaque envelopes.” (p. 408)</p> <p>“The groups were similar in all measures with the exception of “one sway measure (eyes open, foam) where the exercisers performed better than the controls.” (p. 410)</p> <p>Barnett by e-mail: “It was a computerised random number program, the numbers were then put into an envelope by a blinded person and numbered by someone else 1-300.”</p>
Allocation concealment (selection bias)	Low risk	“The subjects were randomised in matched blocks (n=6) after the baseline assessment using consecutively numbered opaque envelopes.” (p. 408)
Blinding of participants and personnel (performance bias)	High risk	Comment: Participants knew whether they received an intervention or not.
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	“Three assessors blind to treatment status administered the physical performance and general health measure assessments.” (p. 408)
Blinding of outcome assessment (detection bias)	N/A	N/A

Entry	Judgement	Support for judgement
(mortality)		
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	N/A
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	Low risk	<p>“The data were analysed on an intention to treat basis.” (p. 410)</p> <p>Comment: Table 2 shows the baseline and six-month retest scores for the physical functioning, health status and activity measures for the intervention and control groups.</p> <p>Experimental group: 67 of 83 (76%) completed the trial; control group: 70 of 80 (80%) completed the trial.</p>
Selective reporting (reporting bias)	Unclear	Sent second e-mail to inquire about a published proposal. Unsuccessful.

Brach, J.S., Fitzgerald, S., Newman, A.B., Kelsey, S., Kuller, L., van Swearingen, J.M., et al. 2003. Physical activity and functional status in community-dwelling older women: A 14-year prospective study. *Archives of Internal Medicine*, 163(21),2565-71.

Kriska, A.M., Bayles, C., Cauley, J.A. & LaPorte, R.E. 1986. A randomized exercise trial in older women: Increased activity over two years and the factors associated with compliance. *Medicine and Science in Sports and Exercise*, 18(1986),557-62.

Pereira, M.A., Kriska, A.M., Day, R.D., Cauley, J.A., LaPorte, R.E. & Kuller, L.H. 1998. A randomized walking trial in postmenopausal women: Effects on physical activity and health 10 years later. *Archives of Internal Medicine*, 158(15),1695-701.

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Unclear	Method of randomisation not specified. (Pereira et al. 1986: 557)
Allocation concealment (selection bias)	Unclear	Not specified. (Pereira et al. 1986: 557)
Blinding of participants and personnel (performance bias)	High	Participants and personnel were aware of the group allocation due to the nature of the intervention
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Unclear	Not specified. (Pereira et al. 1986: 557)
Blinding of outcome assessment (detection bias) (mortality)	N/A	-

Entry	Judgement	Support for judgement
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	Not reported here.
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	Low risk	<p>“Of the original 229 women, 171 completed the clinic visit, 17 participated in telephone interviews only (14 had complete and 3 had incomplete telephone interviews), 20 were deceased, 8 were too sick to participate, 10 were lost to follow-up, and 3 refused to participate. Therefore, self-report or questionnaire data were potentially available for 188 women and performance-based data were potentially available for 171 women.” (Brach 2003: 2 566)</p> <p>Comments: Self-report data available for analysis 188 of 229 (82%), and 171 of 229 (75%) for performance-based data.</p>
Selective reporting (reporting bias)	High	<p>Baseline measures not reported at 10-year follow-up: triceps skinfold, supra-iliac skinfold, smoking, blocks walked, stair climbing, kCalories consumed, LSI (day and evening counts).</p> <p>14-year follow-up: Similar</p>

Burch, S., Longbottom, J., McKay, M. & Prevost, T. 1999. A randomized controlled trial of day hospital and day centre therapy. *Clinical Rehabilitation*, 13(2),105-12.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	"...subjects were randomly allocated to day hospital or day centre by a sequence of labelled tickets in sealed, opaque envelopes securely kept and opened by a senior ward clerk unattached to the trial team. These were assembled elsewhere by Professor Khaw in computer-generated blocks of 20." (Burch: 106-107)
Allocation concealment (selection bias)	Low risk	"...by a sequence of labelled tickets in sealed, opaque envelopes securely kept and opened by a senior ward clerk unattached to the trial team. These were assembled elsewhere by Professor Khaw in computer-generated blocks of 20." (p. 106)
Blinding of participants and personnel (performance bias)	High risk	<p>"A research sociologist (SB) blind to treatment venue interviewed patients for the Philadelphia Geriatric Morale Scale and Abbreviated Mental Test score." (p. 107)</p> <p>Comment: Well-described blinding procedures were used.</p> <p>Comment: Patients and staff knew whether they were treated or gave treatment at the day hospital or at the day centre.</p>
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	High risk	<p>"A research sociologist (SB) blind to treatment venue interviewed patients for the Philadelphia Geriatric Morale Scale and Abbreviated Mental Test score." (p. 107) "The interviewer correctly identified 38/55 as day hospital and 20/38 as day centre, yielding kappa = 0.22 indicating poor agreement/successful</p>

Entry	Judgement	Support for judgement
Blinding of outcome assessment (detection bias) (mortality)	N/A	blinding.” (p. 110)  Comment: Only self-reported outcomes
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-Baseline, 6 weeks))	Low risk	<p><i>Day hospital</i></p> <p>Fifty patients were allocated to day hospital. Three-months' data were unavailable for 17 patients (Figure 1). One subject's score was estimated (see statistics section, above) because their carer was unavailable at three months, giving a total of 34 Barthel Indexes. For the Caregiver Strain Index, in addition to the 17 missing patients seven had no carer and three carers were unavailable, giving 23 three-month scores. There were 35 Philadelphia Geriatric Morale Scores since two subjects whose carers were unavailable could be interviewed.</p> <p><i>Day centres</i></p> <p>Fifty-five subjects were allocated to day centres (26 to St Neots, 29 to Huntingdon). Three months' data were unavailable for 18 patients (Figure 1). One subject's Barthel Index was estimated because the patient was ill at three months, giving 38 three-month scores. For the Caregiver Strain Index in addition to the 18 missing patients, eight had no carer, three were unobtainable and one subject disallowed contact, but for two subjects (one too tired, one too ill) three-month data could be estimated, giving 27 three-month Caregiver Strain scores. For the Philadelphia Geriatric Morale Scale omissions were as for the Barthel Index, except that one subject had become too demented to be interviewed and for two subjects (one too tired, one too ill) three-month data could be estimated, giving ...“</p>



Entry	Judgement	Support for judgement
		<p>This analysis was based on intention to treat including all patients. To corroborate conclusions, the analysis was repeated on an as-treated basis to check the sensitivity of the conclusions to subjects switching treatment group.” (p. 107)</p>
<p>Incomplete outcome data addressed (attrition bias) (longer-term outcomes (&gt;6/12 weeks)</p>	<p>Low risk</p>	<p>Comment: Same as at three months.</p>
<p>Selective reporting (reporting bias)</p>	<p>Unclear</p>	<p>All rating scales mentioned in the methodology and introduction were again mentioned in the results (some not being statistically significant).</p>

Ciaschini, P.M., Straus, S.E., Dolovich, L.R., Goeree, R.A., Leung, K.M., Woods, C.R., et al. 2009. Community-based intervention to optimise falls risk management: A randomised controlled trial. *Age and Ageing*, 38(6),724-30.

Ciaschini, P.M., Straus, S.E., Dolovich, L.R., Goeree, R.A., Leung, K.M., Woods, C.R., et al. 2010. Community based intervention to optimize osteoporosis management: randomized controlled trial. *BMC Geriatrics*, [Internet] 10(1),60 [http://dx.doi.org/10.1186/1471-2318-10-60].

Protokol ID: NCT00465387). <http://clinicaltrials.gov/ct2/show/record/NCT00465387>  
 Accessed on 1 March 2012.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“Eligible patients were randomised, using a computer generated randomisation scheme under the supervision of the study biostatistician, into an immediate intervention protocol (IP) group or to usual care.”(Ciaschini 2009: 726)</p> <p>“Baseline characteristics were similar among the groups (Table 1).” (Ciaschini 2010: 3)</p>
Allocation concealment (selection bias)	Unclear	<p>Comment: Not explicitly mentioned.</p> <p>E-mailed the second author unsuccessfully.</p>
Blinding of participants and personnel (performance bias)	High risk	<p>“The patients, treating physicians and outcomes collectors could not be blinded to the intervention status.” (Ciaschini 2009: 726)</p>
Blinding of outcome assessment (detection bias)	High risk	<p>“The patients, treating physicians and outcomes collectors could not be blinded to the intervention status.” (Ciaschini 2009: 726)</p>

Entry	Judgement	Support for judgement
(patient-reported outcomes)		
Blinding of outcome assessment (detection bias) (mortality)	N/A	“Data on falls and fractures were collected independently from patient diaries as well as hospital and GroupHealth Centre electronic health records.”
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	Low risk	<p>“Analysis was by intention to treat.” (Ciaschini 2009: 726)</p> <p>Comment: 201 were recruited, 176 completed (88% completion).</p> <p>Reasons for anon-completion however similar. Unclear how absent data were handled.</p>
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	Low risk	<p>“Analysis was by intention to treat.” (Ciaschini 2009: 726)</p> <p>Comment: Data for all 201 participants were analysed. However, the authors do not explain how missed data were handled.</p>
Selective reporting (reporting bias)	N/A	<p>“Fall risk management, assessment and management of gate [sic], strength and balance deficits, completion of medication review, including postural hypotension and psychotropic medications as well as the assessment and management of environmental risk factors” (Protocol: NCT00465387)</p> <p>“The main outcome was appropriate falls risk management at 6 months. Measurements of outcomes were obtained through patient records (obtained through the electronic medical record). Additional detail about targeted physiotherapy and occupational therapy services was obtained through standardised</p>

Entry	Judgement	Support for judgement
		<p>reports from the community-based therapists. A standardised chart review of the electronic medical record was the primary source of data for both study groups. Secondary outcomes included falls, hospital admissions related to falls and fractures at 6 and 12 months. Falls and falls-related injuries were obtained from electronic medical records as well as patient diaries. Medication use was obtained through a chart review and a home visit assessment during the intervention period and through a chart review alone in the usual care group at 6 months. At 12 months, medication review during the home visit was also performed in the usual care group.” (p. 726)</p> <p>Comment:</p> <p>The only three secondary outcomes that are reported at six months are: reported falls, documented fragility fracture and hospital admission post fall. (Table 2)</p> <p>Figure 1 listed a whole array of risk factors that could be aligned with the secondary outcomes listed in the protocol. However, none of these were analysed at six months.</p>
Others	High risk	<p>“We acknowledge that our study was not powered to look at falls as the primary outcome.” (p. 728)</p> <p>Comment: However, data for 201 participants were analysed and the Methods section indicated this as enough.</p> <p>To allow for computation of adjusted risks, multiple logistic regressions was used to determine whether risk factors were predictive of falls. All risk factors were included in the initial model, non-significant factors were eliminated and the reduced model was tested for</p>

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
		<p>significance.</p> <p>Comment: The results of none of these analyses were reported.</p>

Gill, T.M., McGloin, J.M., Gahbauer, E.A., Shepard, D.M. & Bianco, L.M. 2001. Two recruitment strategies for a clinical trial of physically frail community-living older persons. *Journal of the American Geriatrics Society*, 49(8),1039-45.

Gill, T.M., Baker, D.I., Gottschalk, M., Peduzzi, P.N., Allore, H. & Byers, A. 2002. A program to prevent functional decline in physically frail, elderly persons who live at home. *New England Journal of Medicine*, 347(14),1068-74.

Gill, T.M., Baker, D.I., Gottschalk, M., Gahbauer, E.A., Charpentier, P.A., de Regt, P.T., et al. 2003. A prehabilitation program for physically frail community-living older persons. *Archives of Physical Medicine & Rehabilitation*, 84(3),394-404.

Gill, T.M., Baker, D.I., Gottschalk, M., Peduzzi, P.N., Allore, H. & Van Ness, P.H. 2004. A prehabilitation program for the prevention of functional decline: effect on higher-level physical function. *Archives of Physical Medicine and Rehabilitation*, 85(7),1043-9.

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Unclear	<p>“The base-line characteristics were similar in the two groups, although there was a slightly higher proportion of women in the intervention group (P=0.07) (Table 2).” (Gill 2002: 1070)</p> <p>“Participants were randomized within strata, defined on the basis of recruitment strategy and level of physical frailty, using a computer-generated algorithm” (Gill 2004).</p> <p>Method of randomisation not specified.</p>
Allocation concealment (selection bias)	Unclear	Unsuccessfully e-mailed the first author.
Blinding of participants and	High risk	Comment: Not possible due to the nature of the intervention and control.

Entry	Judgement	Support for judgement
personnel (performance bias)	Low risk	<p>“Home-based assessments were completed at baseline and at 7 and 12 months by a team of 4 research nurses who had no role in the intervention and were unaware of the exact nature of the study and of the participants’ group assignments. These nurses underwent intensive training and followed standard procedures outlined in a detailed manual. All data were collected on standardized, pre-coded forms, were entered twice in a computerized database, and underwent extensive checks of error and validity.” (p. 1044)</p>
Blinding of outcome assessment (detection bias) (mortality)	N/A	
Incomplete outcome data addressed (attrition bias) (short- term outcomes (2-6 weeks))	N/A	<p>As reported elsewhere among the 94 participants randomized to the intervention group, 61 (64.9%) completed the program, and 20 (21.3%) ended the program prematurely, after an average _ standard deviation (SD) of 9.5_4.1 home visits. The remaining participants (13.8%) did not receive the intervention, primarily for reasons of worsening personal or family health. ... Overall, adherence to the training program was high, with completion of 73.4%, 78.4%, and 78.7% of the assigned exercises for balance, lower-extremity, conditioning, and upper-extremity conditioning, respectively. (p. 1044)</p> <p>Among the 94 participants randomized to the control group, 78 (83.0%) completed the program, 7 (7.4%) discontinued the program after a mean of 1.3_1.5 visits because of death or a move after an acute illness or injury, and 9 (9.6%) refused to continue the program after a mean of 1.8_1.1 visits. (p. 1045)</p>

Entry	Judgement	Support for judgement
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (3, 6/7 and 12 months))	Low risk	<p>All analyses were according to intention-to-treat.</p> <p>“All analyses were according to intention-to-treat ” (p. 1045)</p> <p>Comment: Data were analysed for 96% of the intervention group and 96% of the control group (at 7 months) for 87 of 94 (94%) or the intervention group and for 90 of 98 (96%) (Fig 1) (at 12 months).</p>
Selective reporting (reporting bias)	Unclear	Unsuccessfully e-mailed the first author.



Gitlin, L.N., Winter, L., Dennis, M.P., Corcoran, M., Schinfeld, S. & Hauck, W.W. 2006. A randomized trial of a multicomponent home intervention to reduce functional difficulties in older adults. *Journal of the American Geriatrics Society*, 54(5),809-16.

Gitlin, L.N., Winter, L., Dennis, M.P. & Hauck, W.W. 2008. Variation in response to a home intervention to support daily function by age, race, sex, and education. *Journals of Gerontology: Series A: Biological Sciences and Medical Sciences*, 63(7),745-50.

Gitlin, L.N., Hauck, W.W., Dennis, M.P., Winter, L., Hodgson, N. & Schinfeld, S. 2009. Long-term effect on mortality of a home intervention that reduces functional difficulties in older adults: Results from a randomized trial. *Journal of the American Geriatrics Society*, 57(3),476-81.

Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Unclear	<p>“The project codirectors (LW, SS) randomized participants”</p> <p>“Study participants were stratified by race (white, non white) and living arrangement (alone, with others) and randomized within each of four strata using random permuted blocks to control for possible changes in subject mix overtime”</p> <p>Method of randomisation not specified.</p>
Allocation concealment (selection bias)	Low risk	<p>“Randomization lists and four sets of randomization were prepared using double, opaque envelopes”</p> <p>“The blocking number, developed by the project statistician (WWH), remained unknown to others”</p>
Blinding of participants and personnel (performance bias)	High risk	<p>Comment: Patients who received treatment were aware of it. Physiotherapists who delivered intervention knew about it.</p>

Entry	Judgement	Support for judgement
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	<p>“..., and trained interviewers who were masked to group assignment and study hypotheses and who had no role in the intervention interviewed them at 6 and 12 months.”</p> <p>“interviewers masked to group assignment”</p>
Blinding of outcome assessment (detection bias) (mortality)	Low risk	Obtained from the “National Death Index and Advancing Better Living for Elders”
Incomplete outcome data addressed (attrition bias) (short-term outcomes (6 weeks))	Low risk	None of the 319 participants dropped out within the first 6 weeks.
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (12 months))	Low risk	<p>12 months: 34/319 missing from sample population.</p> <p>“14 died, 1 was hospitalized, 4 were dissatisfied with the study, 5 entered nursing homes, 8 were unable to be located, and 2 had significantly deteriorating health.”</p> <p>“Figure 1 presents an estimate of a life table to 4 years from baseline interview for participants according to treatment assignment without stratification according to level of risk.” (Gitlin 2009: 478)</p> <p>Comment: Reasons differed for discontinuation, but only 11% were lost for analysis.</p>
Selective reporting (reporting bias)	Unclear	Could not find evidence that the proposal had been published.

Grant, J.A., Mohtadi, N.G.H., Maitland, M.E. & Zernicke, R.F. 2005. Comparison of home versus physical therapy supervised rehabilitation programs after anterior cruciate ligament reconstruction: A randomized clinical trial. American Journal of Sports Medicine, 33(9),1288-97.

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Unclear	<p>“Once enrolled, a stratified and blocked randomization procedure (opaque envelope draw) was used to ensure that no large differences existed in group size. Patients were stratified by surgeon to ensure that differences between surgeons did not influence the results...”</p> <p>Process of randomisation not described. “There were no clinically relevant differences demonstrated at baseline between the 2 groups (Table 3).”(p. 1292)</p>
Allocation concealment (selection bias)	Low risk	“... opaque envelope draw” (p. 1289)
Blinding of participants and personnel (performance bias)	High risk	<p>“The study was a 2-arm, single-blind” “The group assignment was revealed to the patients after leaving the preoperative education session.” (p. 1289)</p> <p>Comment: Patients will know what will be done to them, increasing their compliance with the intervention.</p>
Blinding of outcome assessment (detection bias) (patient-reported)	Low risk	“...2-arm, single-blind...” “... the assessor was blinded to group assessment.” “...Patients were repeatedly told not to inform the assessor of their group assignment in any way.” (p. 1290)

Entry	Judgement	Support for judgement
outcomes)		
Blinding of outcome assessment (detection bias) (mortality)	Low risk	Ditto
Incomplete outcome data addressed (attrition bias) (short-term outcomes (6 weeks))	Low risk	<p>Low risk is implied as long-term attrition was low.</p> <p>Six weeks: "...The 6-week data (i.e., pre-MUA) for the ligament laxity were included in the intention-to-treat analysis. The strength data were consequently treated as worst-case scenarios for the intention-to-treat analysis, as there was no 6-week assessment of strength." (p. 1293)</p> <p>Comment: No evaluation was done or reported half way through the study...</p>
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (12 weeks))	Low risk	<p>12 weeks: 129/145 attended assessment. 16/145 lost to follow-up. Reasons differ throughout groups.</p> <p>Comment: Intention-to-treat analysis. "A separate intention-to-treat analysis was performed for all of the clinical outcomes to ensure that losses to follow up in either study group did not lead to biased results. Patients who declined participation post randomization were treated as worst-case outcomes (i.e., unacceptable for all outcomes). Patients who did not decline participation but failed to attend any of the follow-up assessments (6 and 12 weeks) were also treated as worst-case outcomes. Patients who attended the 6-week assessment but did not return for the 12-week assessment were treated as last data carried forward." (p. 1291,2)</p>
Selective reporting (reporting bias)	Low risk	Most of the outcome measures mentioned at the beginning were reported in other places.

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Protocol unsuccessfully requested from author.		

Green, J., Forster, A., Bogle, S. & Young, J. 2002. Physiotherapy for patients with mobility problems more than 1 year after stroke: A randomised controlled trial. *The Lancet*, 359(9302),199-203.

Green, J., Young, J., Forster, A., Collen, F. & Wade, D. 2004. Combined analysis of two randomized trials of community physiotherapy for patients more than one year post stroke. *Clinical Rehabilitation*, 18(3),249-52. doi:10.1191/0269215504cr747oa

(one study, two districts)

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“Randomisation was achieved by numbered, sealed, opaque envelopes prepared from random number tables and used four length random permuted blocks.” (Green 2002: 200)</p> <p>“The characteristics of the two groups were reasonably similar at baseline (table 1).” (Green 2002: 200)</p>
Allocation concealment (selection bias)	Low risk	<p>“Randomisation was achieved by numbered, sealed, opaque envelopes prepared from random number tables and used four length random permuted blocks.” (Green 2002: 200)</p>
Blinding of participants and personnel (performance bias)	High risk	<p>Comment: Blinding not possible due to nature of the intervention.</p>
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	High risk	<p>“All assessments were done in patients’ homes by one researcher who did not know treatment allocation. Unmasking of treatment groups was assessed by the researcher guessing the trial group for every patient at the 3-month assessment; we measured the</p>

Entry	Judgement	Support for judgement
		<p>agreement between guess and actual group allocation with the <math>\kappa</math>-statistic.” (Green 2002: 200)</p> <p>“The independent assessor was told treatment allocations at the 3-month assessment by 18 patients or carers in the intervention group and three in the control group.” “The assessor correctly guessed the allocation of 82 (59%) of the remaining 140 patients at 3-month assessment (<math>\kappa &lt; 0.20</math> indicating ‘poor’ agreement).” (Green 2002: 200)</p>
Blinding of outcome assessment (detection bias) (mortality)	N/A	N/A
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	N/A
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	Low risk	Comment: Table 1: Available for analysis: Treatment group (129/134 (96%) and Control group (121/130 (93%).
Selective reporting (reporting bias)	Unclear	Proposal unsuccessfully requested from author.

Irvine, L., Conroy, S.P., Sach, T., Gladman, J.R., Harwood, R.H., Kendrick, D., et al. 2010. Cost-effectiveness of a day hospital falls prevention programme for screened community-dwelling older people at high risk of falls. *Age and Ageing*, 39(6),710-6.

Masud, T., Coupland, C., Drummond, A., Gladman, J., Kendrick, D., Sach, T., et al. 2006. Multifactorial day hospital intervention to reduce falls in high risk older people in primary care: a multi-centre randomised controlled trial [ISRCTN46584556]. *Trials*, 7(1),5.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“After giving informed consent patients will be randomly allocated (1:1 ratio) to either the intervention group or to the control group. Randomisation will be made by telephone to the TRDSU who will be blind to the identity of the patient, and will use a computer program (Stata) to carry out stratified block randomisation based on study centre (Nottingham, Derby).” (Masud 2006: n.p.)</p> <p>“Consenting participants were allocated into the intervention or control arm by research assistants, using an internet-based randomisation service provided by the host institution’s Clinical Trials Unit.” (Irvine 2010: 711)</p> <p>“The baseline characteristics of the study population are shown in Supplementary data available in Age and Ageing online. The two study arms were well balanced with respect to most characteristics, including age, previous falls history and aggregated falls risk.” (Irvine 2010: 712)</p>
Allocation concealment (selection bias)	Low risk	See previous row



Entry	Judgement	Support for judgement
Blinding of participants and personnel (performance bias)	High risk	Comment: Not possible due to the nature of the intervention.
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	Comment: Cross-referenced to hospital and primary care documents.
Blinding of outcome assessment (detection bias) (cost analysis)	Low risk	Collected prospectively by day-hospital staff (Irvine 2010: 711)
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	Low risk	<p>“... 364/6133 (6%) of all people screened took up the offer...”</p> <p>Comment: Reasons were comparable between groups.</p>
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks to 2 months))	Low risk	<p>“One hundred and eighty-one were randomised into the control arm and 183 into the intervention arm.” (Irvine 2010: 712)</p> <p>“There were 9 withdrawals in the control arm and 10 in the intervention arm, who provided no falls outcome data, so analyses were based on 172 participants in each arm.” (Irvine 2010: 712)</p> <p>Comment: Treatment group analysed 172 of 181 (95%) and Control group analysed 172 of 183 (94%).</p>
Selective reporting (reporting bias)	Probably high risk	<p>Primary outcome:</p> <p>The proportion of older people who fall over one year identified in primary care as being at high risk of</p>

Entry	Judgement	Support for judgement
		<p>falling.</p> <p>Secondary outcomes:</p> <ol style="list-style-type: none"> <li>1. Proportion of people with single or recurrent falls (greater than 1)</li> <li>2. Fall-related injuries: fracture, serious sprain requiring immobilisation in plaster, joint dislocations, head injury requiring hospitalisation, and lacerations requiring suturing</li> <li>3. Disability: Nottingham Extended Activities of Daily Living Scale; Barthel Index of Daily Living; Quality of life: Falls Efficacy Scale and EuroQoL-5</li> <li>4. Institutionalisation and use of health services: residency and diary information</li> <li>5. Cost analysis</li> <li>6. Screening tool, defined by sensitivity/specificity as well as positive and negative predictive values</li> <li>7. Deaths will be checked against PCT records and measured as proportions (Only primary outcome, cost and Use of Health Services were reported. )</li> </ol> <p>E-mailed authors to find out if they've published results elsewhere (however, not cited on the protocol page).</p>

Jessep, S.A., Walsh, N.E., Ratcliffe, J. & Hurley, M.V. 2009. Long-term clinical benefits and costs of an integrated rehabilitation programme compared with outpatient physiotherapy for chronic knee pain. *Physiotherapy*, 95(2),94-102.

Protocol <http://www.controlled-trials.com/ISRCTN63848242>

Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	“After baseline assessment, participants were allocated to receive outpatient physiotherapy or ESCAPE-knee pain using a randomisation list generated and held at a centre away from Sevenoaks Hospital to ensure concealed allocation.” (Jessep 2009:96) “At baseline, there were no differences in the anthropometric characteristics or clinical variables of participants allocated to outpatient physiotherapy or ESCAPE-knee pain (Table 1). There were no differences in any of the baseline characteristics between participants who remained in the trial and those who withdrew.” (Jessep 2009: 98)
Allocation concealment (selection bias)	Low risk	“After baseline assessment, participants were allocated to receive outpatient physiotherapy or ESCAPE-knee pain using a randomisation list generated and held at a centre away from Sevenoaks Hospital to ensure concealed allocation.” (Jessep 2009:96)
Blinding of participants and personnel (performance bias)	High risk	“This pragmatic, randomised controlled trial compared outpatient physiotherapy with an integrated rehabilitation programme that combined exercise, patient education, self management and coping strategies.” (Jessep 2009: 95)  Comment: The participants knew which intervention they received and the personnel knew which intervention they provided.

Entry	Judgement	Support for judgement
Blinding of outcome assessment (detection bias) (patient-reported outcomes: Womac, Womac-Pain)	Low risk	<p>“The assessor was unaware of each participant’s treatment allocation.” (Jessep 2009: 96)</p> <p>Comment: Assessors were blinded from knowledge of which group received which intervention.</p>
Blinding of outcome assessment (detection bias) (CSIR)	Low risk	Ditto
Incomplete outcome data addressed (attrition bias) (short-term outcomes (post intervention))	Low risk	<p>All clinical and cost data analyses were by intention-to-treat (i.e. participant data were analysed in the groups to which they were randomised) (Jessep 2009: 97)</p> <p>Comment: Data available for analysis post intervention: Intervention group: 31/35 (89%) and Control: 27/35 (77%).</p>
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (12 months))	Low risk	<p>From Figure 1: At 12 months: 4/35 missing from control group. 1 had heart surgery, 1 moved away and 2 stopped attending. 5/29 missing from intervention group. 1 developed hip complications, 1 had related knee surgery, 1 moved away and 1 stopped attending.</p> <p>Comment: Reasons for drop-out are similar.</p> <p>Data available for analysis at 12 months: Intervention 26/29 (90%) and Control 21/20 (72%).</p>
Selective reporting (reporting bias)	Low risk	<p>From protocol:</p> <p>Primary outcome: WOMAC</p>

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
		<p>Secondary outcomes:</p> <ol style="list-style-type: none"><li>1. Aggregate Functional Performance Test (AFPT)</li><li>2. Health-related quality of life using the Euroqol</li><li>3. Exercise self-efficacy</li><li>4. Depression using the Hospital Anxiety and Depression scale</li></ol> <p>Comment: Findings were reported for all five measures.</p>

Kuisma, R. 2002. A randomized, controlled comparison of home versus institutional rehabilitation of patients with hip fracture. *Clinical Rehabilitation*, 16(5),553-61.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“The patients who were included in the study were allocated to the study or control group using blind block randomization. The block randomization was performed by the researcher before the trial started. A letter indicating the group was placed in a sealed envelope and the envelopes were kept in the randomized order in the office of a senior therapist who was not involved in the study. At the first meeting when the patients were allocated to the two groups, the physiotherapist opened the sealed envelopes.” (p. 556)</p> <p>“The characteristics of the two groups of subjects were very similar with regard to age, gender, social background, living situation, pre injury health status, type and side of fracture, surgical intervention and recovery from the incident. Ambulation ability before the injury was also very similar between the two groups and none of the characteristics were statistically different.” (pp. 556,7)</p>
Allocation concealment (selection bias)	Low risk	<p>“A letter indicating the group was placed in a sealed envelope and the envelopes were kept in the randomized order in the office of a senior therapist who was not involved in the study.”(p. 556)</p>
Blinding of participants and personnel (performance bias)	High risk	<p>Participants and personnel were aware of the setting where the treatment took place.</p>
Blinding of outcome assessment	Low risk	<p>“An independent person not involved in the treatment of these patients at any time, conducted telephone interviews at four, eight and twelve</p>

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
(detection bias) (patient-reported outcomes)		months after surgery. The interview included the same ambulation outcome measures as the PAAF.” (p. 556)
Blinding of outcome assessment (detection bias) (mortality)	N/A	N/A
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	Low risk	At discharge: zero attrition
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	High risk	Comment:  Study group: 9 missing (40 minus 31) (78% available for analysis), and Control group: 16 missing (40 minus 25) (62% available for analysis).
Selective reporting (reporting bias)	Unclear	Proposal was unsuccessfully requested from the author via e-mail.

Lin, J.H., Hsieh, C.L., Lo, S.K., Chai, H.M. & Liao, L.R. 2004. Preliminary study of the effect of low-intensity home-based physical therapy in chronic stroke patients. *Kaohsiung Journal of Medical Sciences*, 20(1),18-23.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Unclear	<p>“patients were randomly assigned”</p> <p>Comment: Method not described. E-mailed the authors unsuccessfully.</p> <p>“Baseline characteristics are shown in Table 1. The groups given immediate therapy and delayed therapy were not significantly different at randomization.” (p. 20)</p>
Allocation concealment (selection bias)	Unclear	<p>Comment: No mention of concealment. E-mailed the authors unsuccessfully.</p>
Blinding of participants and personnel (performance bias)	Low risk	<p>“Assessments and treatments took place at patients’ homes, and independent assessors and therapists were not informed of the patients’ treatment groups” (p. 19)</p> <p>Comment: Patients were treated at home: not aware that other participants received a different intervention.</p>
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	<p>“blinded, randomized, simple crossover.”</p> <p>“Assessments and treatments took place at patients’ homes, and independent assessors and therapists were not informed of the patients’ treatment groups” (p. 19)</p> <p>Comment: Probably done.</p>
Blinding of outcome assessment (detection bias)	N/A	N/A



Entry	Judgement	Support for judgement
(mortality)  Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	No short term, the patients were only assessed at baseline.
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	Low risk	Comment:  Table 2:  11 weeks: 9/9 in immediate home-based physical therapy (Group I) were assessed again, 10/10 in “after a 10-week delay” (Group II) were assessed again.  22 weeks: 9/9 in immediate home-based physical therapy (Group I) completed the trial, 10/10 in “after a 10-week delay” (Group II) completed the trial.
Selective reporting (reporting bias)	Unclear	E-mailed the authors unsuccessfully for the proposal.

Lord, S., McPherson, K.M., McNaughton, H.K., Rochester, L. & Weatherall, M. 2008. How feasible is the attainment of community ambulation after stroke? A pilot randomized controlled trial to evaluate community-based physiotherapy in subacute stroke. *Clinical Rehabilitation*, 22(3),215-25.

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	“Computer-generated randomization was used to allocate participants to either: ...:”(p. 216)
Allocation concealment (selection bias)	Low risk	“A third party scheme, using opaque envelopes created at the central coordinating centre, was used to allocate consecutive participants so that within each centre the research coordinator could not influence the actual allocation.” (p. 216)
Blinding of participants and personnel (performance bias)	High risk	“Therapists were not informed of the ... treatment groups.”  Comment: Not possible due to the nature and setting of the intervention (clients).
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	“A blinded assessor who was not involved with randomization or treatment measured study participants within one week of final treatment (T2), and again at follow-up after six months (T3). Assessments took place in the physiotherapy department of each participating centre, and all assessors were senior clinical physiotherapists.” (p. 216)
Blinding of outcome assessment	N/A	No mortality data

Entry	Judgement	Support for judgement
(detection bias) (mortality)	Low risk	<p>“Three participants withdrew from the trial once randomized: one experienced a second stroke (physiotherapy group; eight treatments), one failed to attend for appointments (physiotherapy group; five treatments); one was dissatisfied (community group; three treatments).” (p. 218)</p> <p>“Thirty participants were included in the analysis 16 in the physiotherapy group and 14 in the community group.” (p 218)</p> <p>Comment: Data available for analysis 16/21 (76%) and 14/15 (93%).</p>
Incomplete outcome data addressed (attrition bias) (short-term outcomes (11 weeks))	High risk	<p>Data from three participants were not available at six-month follow-up: one participant from the physiotherapy group was lost to six-month follow-up, and two in the community group were unwell.</p> <p>Comment: Percentage available for data-analysis: 71% (intervention) and 57% (controls).</p>
Reporting (reporting bias)	Unclear	<p>Need to consult the proposal. Requested unsuccessfully from the author.</p>

Luukinen, H., Lehtola, S., Jokelainen, J., Vaananen-Sainio, R., Lotvonen, S. & Koistinen, P. 2007. Pragmatic exercise-oriented prevention of falls among the elderly: a population-based, randomized, controlled trial. *Preventive Medicine*, 44(3),265-71.

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Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“Randomization was done by the study statistician using a random numbers table.” (p. 267)</p> <p>“The similar baseline characteristics of the subjects in the intervention and control groups are presented in Table 1. Among those able to move outdoors, trouble with vision was less common in the intervention than the control population; 28(16%) and 45 (26%)” (p. 267)</p>
Allocation concealment (selection bias)	Unclear	Wrote unsuccessfully to the authors.
Blinding of participants and personnel (performance bias)	High risk	Comment: OTs, PTs and patients could not be blinded.
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Unclear	<p>Wrote unsuccessfully to the authors:</p> <p>1. Who performed the intervention? Did the OT and PTs only plan the intervention, but not implement it? Here are two quotes for your convenience:</p> <p>“The individual intervention plans were made during home visits by a physiotherapist and an occupational therapist based on the risk factors. ... The occupational therapist planned the self-care exercises, which aimed to improve the management of personal daily activities.” (p. 267)</p>

Entry	Judgement	Support for judgement
		<p>“The intervention programme along with the baseline and follow-up examinations were carried out by the geriatric nurses (N=40) of the home care service of the City of Oulu. This service is responsible for all home care of elderly people in the city.” (p. 266)</p> <p>2. As the previous paragraph stated that the nurses were responsible for intervention and baseline and follow-up examinations, the following paragraph is confusing:</p> <p>“In connection with the bi-monthly fall recordings, the research nurse inquired about the physical exercise done by the subject during the preceding 2 weeks. The frequency (times) and duration (minutes) of home exercise, walking (ordinary walking during the daily activities, including shopping) and group exercise (group gymnastics) were asked about, but the types of exercise were not inquired because the research nurse was blinded to the randomization. Self-care exercises were not included in this questionnaire.” (p. 267)</p> <p>Would you kindly clarify?</p>
Blinding of outcome assessment (detection bias) (falls)	N/A	N/A
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	<p>“Fall recording lasted from the baseline examinations (October 16, 2000–March 26, 2001) through the start of the intervention (September 3, 2001–February 14, 2002) until the end of the follow-up period, i.e., the last round of phone calls (January 28–June 11, 2003).” (p. 267)</p> <p>Comment: No short-term measurements.</p>

Entry	Judgement	Support for judgement
<p>Incomplete outcome data addressed (attrition bias) (longer-term outcomes (1 year post the start of the intervention))</p>	<p>N/A</p>	<p>Follow-up examinations were carried out during January 27, 2003–August 20, 2003.</p> <p>“Primarily, we used intention-to-treat analyses.” (p. 627)</p> <p>“Missing data:</p> <p>The intervention subjects without follow-up data (N=36) had more often slow walking speed at baseline (p&lt;0.05), low cognitive status (p&lt;0.01), impaired chair stand (p&lt;0.05) and lower mobility scores (p&lt;0.05) compared to the subjects with follow-up data (N=144). Correspondingly, the control subjects without follow-up data (N=26) had poorer mobility scores (p&lt;0.05) and ADL scores (p&lt;0.05) compared to the subjects with these data (N=152).”(p. 269)</p>
<p>Selective reporting (reporting bias)</p>	<p>Unclear</p>	<p>Requested the proposal unsuccessfully from the authors.</p>

Mitchell, C., Walker, J., Walters, S., Morgan, A.B., Binns, T. & Mathers, N. 2005. Costs and effectiveness of pre- and post-operative home physiotherapy for total knee replacement: Randomized controlled trial. *Journal of Evaluation in Clinical Practice*, 11(3),283-92.

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	<p>“The research nurse opened returned consent forms sequentially and used an independent prepared computer block randomization sequence in opaque sealed envelopes to allocate consenting participants to a treatment group.”(p. 284)</p> <p>“Baseline characteristics were similar in the two groups (Table 3). Patients in the home care group had a significantly longer mean pre-operative waiting time than patients in the hospital group [<math>P=0.036</math>, mean difference 5.2 weeks, 95% confidence interval (CI) =0.4 to 10.1 weeks].” (p. 286)</p> <p>Comment: Bias is in favour of the control group.</p>
Allocation concealment (selection bias)	Low risk	<p>“...computer block randomized sequencing in opaque sealed envelopes to allocate consenting participants into treatment groups.”(p. 284)</p>
Blinding of participants and personnel (performance bias)	High risk	<p>Comment: Participants as well as the personnel knew whether they received physiotherapy treatment on an outpatient basis or at their home.</p>
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Unclear	<p>“The intervention group had pre- and post-operative home visits for assessment and treatment by a community physiotherapist.” (p. 283)</p>

Entry	Judgement	Support for judgement
Blinding of outcome assessment (detection bias) (cost)	Low risk	Information requested from author: no reply.  Comment: Used hospital notes.
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	N/A
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (12 weeks))	Low risk	<p>See Table 1:</p> <p>“Intervention group: Withdrawn (<math>n = 23</math>)</p> <p>Control group: Withdrawn (<math>n = 22</math>)”</p> <p><b>“Reason for participant withdrawal (<math>n = 45</math>)</b></p> <p>Operation cancelled (<math>n = 24</math>)</p> <p>Operation deferred (<math>n = 7</math>)</p> <p>Pre-operative questionnaire not completed (<math>n = 6</math>)</p> <p>No longer fitted study criteria pre-operatively (<math>n = 4</math>)</p> <p>Patient withdrew from trial post-operatively (<math>n = 2</math>)</p> <p>Patient died pre-operatively (<math>n = 2</math>)”</p> <p>Intervention group: “Participated (<math>n = 57</math>)” “Intention to treat analysis <math>n = 57</math>”</p> <p>Control group: “Participated (<math>n = 58</math>)”</p> <p>“Intention to treat analysis <math>n = 57</math>”</p> <p>Comment: Data for analysis were available for 100% of participants in the intervention group and 71%</p>



Entry	Judgement	Support for judgement
Selective reporting (reporting bias)	Unclear	(57/80) of those randomised to the group;  98% in the control group had data available, i.e. 75/80 (71%) of the number that were randomised to this group.  Proposal requested from author: no response received.

Moffett, J.A.K., Jackson, D.A., Richmond, S., Hahn, S., Coulton, S., Farrin, A., et al. 2005. Randomised trial of a brief physiotherapy intervention compared with usual physiotherapy for neck pain patients: outcomes and patients' preference. *BMJ*, [Internet] 330(7482),75 [http://dx.doi.org/10.1136/bmj.38286.493206.82]

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	“The York Trials Unit (Department of Health Sciences, University of York) provided telephone randomisation. Apart from remote randomisation, further blinding was achieved through the allocation sequence, in which randomly permuted block sizes of two and four were used. ... Because this was a fully randomised trial, all participants were randomised irrespective of their baseline preferences. This approach avoids selection bias.”
Allocation concealment (selection bias)	Low risk	Allocation was done via telephone.
Blinding of participants and personnel (performance bias)	High risk	“The same 12 physiotherapists delivered both interventions” Although it was not possible for patients or therapists to be blinded to the treatment allocation, they had no influence over the process of allocation.
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	“and those assessing the outcomes were unaware of the intervention provided.”
Blinding of outcome assessment (detection bias) (mortality)	N/A	N/A
Incomplete outcome	N/A	N/A

Entry	Judgement	Support for judgement
data addressed (attrition bias) (short-term outcomes (2-6 weeks))		
Incomplete outcome data addressed (attrition bias) (3 and 12 months)	Low risk	<p>At 3 months=23/129-lost follow in physiotherapy, 20/139-crossed over to physiotherapy.</p> <p>24/139-lost follow in intervention group. At 12 months loss of follow-ups were similar in both groups (intervention group with 110 participants and 117 for physiotherapy group).</p>
Selective reporting (reporting bias)	Unclear	Need to compare with proposal. Not available.

Munneke, M., Nijkrake, M.J., Keus, S.H., Kwakkel, G., Berendse, H.W., Roos, R.A., et al. 2010. Efficacy of community-based physiotherapy networks for patients with Parkinson's disease: A cluster-randomised trial. *The Lancet Neurology*, 9(1),46-54.

Keus, S.H., Nijkrake, M.J., Borm, G.F., Kwakkel, G., Roos, R.A., Berendse, H.W., et al. 2010. The ParkinsonNet trial: Design and baseline characteristics. *Movement Disorders*, 25(7),830-7.

Entry	Judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	<p>“We did a cluster-randomised trial in the Netherlands including 16 clusters. A cluster design was chosen because it allowed us to assess the complete health-care process, including referral patterns, and it reduced the risk of contamination between groups in the trial ... Clusters were randomly selected from the clusters in the vicinity of the three participating university medical centres.”(Munneke et al. 2010: 47)</p> <p>“An independent biostatistician (GFB) who was not involved in recruitment randomly allocated clusters by use of a variance minimisation algorithm with the factors research area (Nijmegen, Leiden, and Amsterdam), area size (number of patients in the hospital catchment area), and teaching status (presence of teaching facilities for neurology residents).” (Munneke et al. 2010: 47,8)</p> <p>“Baseline characteristics, including the number of participants, physiotherapists, and neurologists, were comparable between the ParkinsonNet and usual-care clusters (table 1).” (Munneke et al. 2010: 50)</p>
Allocation concealment (selection bias)	Unclear	Unclear (Keus et al. 2012)

Entry	Judgement	Support for judgement
Blinding of participants and personnel (performance bias)	High risk	Comment: Not possible.
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	<p>“Participants were instructed not to discuss the nature of their physiotherapy with the research assistants who did the assessments. Questionnaires were returned from participants to the assessors in separate, closed envelopes and were opened by a member of the study group (M J E Likumahwa). ... At baseline and at 16 weeks participants were assessed at home by one of seven trained assessors who were blinded to cluster allocation.” (Munneke 2010: 48)</p>
Blinding of outcome assessment (detection bias) (mortality)	N/A	N/A
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	N/A
Incomplete outcome data addressed (attrition bias) (at 8, 16, and 24 weeks)	Low risk	<p>“Analysis was by intention to treat. Binary variables were analysed in a similar model, with Bernouilli distribution and linear link function. A sensitivity analysis with multiple imputation was done to estimate the possible effect of missing values. Patients without any available information during follow-up were excluded.” (Munneke 2010: 49)</p>
Selective reporting (reporting bias)	Unclear	Proposal not available.

O'Shea, S.D., Taylor, N.F. & Paratz, J.D. 2007. A predominantly home-based progressive resistance exercise program increases knee extensor strength in the short-term in people with chronic obstructive pulmonary disease: A randomised controlled trial. *Australian Journal of Physiotherapy*, 53(4),229-37.

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	<p>“Group allocation sequence was generated by a member of the research team not involved in participant recruitment, and concealed envelopes until after baseline measurements. Participants were stratified according to past pulmonary rehabilitation status and randomly allocated from each stratum, via block randomisation, in one of two groups... Group allocation sequence was generated by a member of the research team not involved in participant recruitment.” (p. 230)</p> <p>“The characteristics of each group were similar at baseline (Table 1).” (p. 231)</p>
Allocation concealment (selection bias)	Low risk	<p>“... and concealed in envelopes until after completion of baseline measurements.” (p. 230)</p>
Blinding of participants and personnel (performance bias)	High risk	<p>Comment: Blinding not possible.</p>
Blinding of outcome assessment (detection bias)	Low risk	<p>“All measurements sessions were conducted by an independent and trained assessor, blinded to group allocation.” (p. 230)</p>

Entry	Judgement	Support for judgement
(patient-reported outcomes)		
Blinding of outcome assessment (detection bias) (mortality)	N/A	N/A
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	N/A
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (>6 weeks))	Low risk	<p>“Intention to treat analysis via the carry forward procedure was used when withdrawing participants were not available for reassessment at follow up.” (p. 230)</p> <p>Figure 1:</p> <p>24/27 of the experimental group were analysed at 12 weeks and</p> <p>22/27 of the control group. (Figure 1)</p> <p>At 24 weeks, 19 of 27 of the experimental group’s data were available for analysis and</p> <p>22 of 27 of the control group.</p> <p>Comment: Percentage for whom data were available:</p> <p>6 months: 74% (Experimental group) and 89% (Control group)</p> <p>12 months: 70% (Experimental group) and 81% (Control group)</p> <p>Comment: Because of the carry forward method the</p>

Entry	Judgement	Support for judgement
Selective reporting (reporting bias)	Unclear	70% at 12 months is not interpreted as high risk. Proposal requested from author: no response received.



Pang, M.Y., Eng, J.J., Dawson, A.S., McKay, H.A. & Harris, J.E. 2005. A Community-based fitness and mobility exercise program for older adults with chronic stroke: A randomized controlled trial. *Journal of the American Geriatrics Society*, 53(10),1667-74.

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<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	Low risk	“The participants were stratified according to sex because men tended to have higher maximal oxygen consumption ( $Lo_{max}$ ), muscle strength, and BMD than women. Participants were randomised into intervention (n=32) or control group (n=31) by drawing ballots with ‘I’ intervention, or ‘C’ control.” (Pang 2005: 1669) “There were no significant differences in any of the variables between the intervention and control groups at baseline ( $P>.20$ for all variables) (Tables 1 and 2).”(Pang 2005: 1670)
Allocation concealment (selection bias)	Low risk	“An individual who was not involved in enrolment or any of the screening and outcome assessments performed the randomization?” (Pang 2005: 1669)
Blinding of participants and personnel (performance bias)	High risk	“Participants were not blind to group assignment.” (Pang 2005: 1668)
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	“The research personnel who performed the outcomes assessments were blinded to the group assignment... Participants were instructed not to tell the assessors about the group assignment or the treatment they received or the protocol with the stroke community.” (Pang 2005: 1668)
Blinding of outcome assessment (detection bias) ( $VO_2max$ )	Low risk	Ditto

Entry	Judgement	Support for judgement
Incomplete outcome data addressed (attrition bias) (short-term outcomes (2-6 weeks))	N/A	N/A
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (19 weeks))	Low risk	<p>“Intention-to-treat analysis was performed. For dropouts, it was conservatively assumed that no changes occurred in any of the outcome measures at 19 weeks. Therefore, the missing values at 19 weeks were input using baseline values for these individuals.” (Pang 2005: 1669)</p> <p>“There were three dropouts.” “Two dropped out of the intervention group: one after six sessions due to inability to commit the time, one after nine sessions because he found the exercise too fatiguing. One dropped out of the control group after eight weeks due to inability to commit the time. It was assumed that there was no improvement on any of the outcomes used for the dropout participants. (Figure 1)” (Pang 2005: 1669, 70)</p> <p>“Study flow chart. Sixty-three individuals were enrolled in the study and were randomly assigned to the intervention (n=32) or control (n=31) group. Thirty individuals in each group completed the program.” (Figure 1) (Pang 2005: 1670)</p> <p>Comment: Percentage of people who completed the trial was 94% in the intervention group and 97% in the control group.</p>
Selective reporting (reporting bias)	Unclear	<p>Four rating scales for BMD, VO<sub>2</sub>max, Berg balance and 6 MWT were performed and reported.</p> <p>Requested the proposal from the authors: no</p>

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
		response received.

Young, J. & Forster, A. 1991a. Methodology of a stroke rehabilitation trial. *Clinical Rehabilitation*, 5(2),127-33.

Young, J.B. & Forster, A. 1991b. The Bradford community stroke trial: eight week results. *Clinical Rehabilitation*, 5(4),283-92.

Young, J.B. & Forster, A. 1992. The Bradford community stroke trial: results at six months. *British Medical Journal*, 304(6834),1085-9.

Young, J. & Forster, A. 1993. Day hospital and home physiotherapy for stroke patients: A comparative cost-effectiveness study. *Royal College of Physicians of London Journal*, 27(3),252-8.

<b>Entry</b>	<b>Judgement</b>	<b>Support for judgement</b>
Random sequence generation (selection bias)	High risk	<p>“Randomization to one of the two treatments was by an independent worker using four length random permuted blocks which ensured that each stratification cell would be well balanced for each trial treatment.” (Young 1991: 284) “The two patient groups were well matched for side of stroke, previous stroke, stroke impairments, age, and presence of a care giver (Table I).” (Young and Foster 1992: 1086)</p> <p>Method of randomisation not mentioned.</p>
Allocation concealment (selection bias)	Low risk	<p>“Just prior to discharge, the information required for stratification is provided to an independent worker (an administrator in the Department of Health Care for the Elderly) who is responsible for randomizing the patient, organizing the assigned treatment and notifying the ward staff.” (Young and Foster 1991a)</p>
Blinding of participants and	High risk	Not possible due to the nature of the intervention.

Entry	Judgement	Support for judgement
personnel (performance bias)		
Blinding of outcome assessment (detection bias) (patient-reported outcomes)	Low risk	“... who was not involved with the randomisation procedure or organising and carrying out treatment.” (Young 1992: 1086)
Blinding of outcome assessment (detection bias) (mortality)	N/A	N/A
Incomplete outcome data addressed (attrition bias) (short-term outcomes (8 weeks))	Low risk	<p>“8 weeks: 7/61 missing from day hospital group and 5/63 missing from home physiotherapy group due to death, new stroke or refusing reassessment.</p> <p>2 changed to home PT”(Flowchart p. 1087)</p> <p>“Intention to treat analysis: all patients, regardless of compliance with protocol, were included.” (Young 1991b: 286)</p> <p>Comment: 8 weeks, percentage not available for analysis in the intervention group was 11% and the control group was 8%. This is interpreted as not high risk.</p>
Incomplete outcome data addressed (attrition bias) (longer-term outcomes (6 months))	Low risk	<p>“By six months 16 patients were lost to follow up (day hospital, 9; home physiotherapy, 7), with most withdrawals occurring during the first eight weeks (figure). A further five patients changed treatments during the first eight weeks but were available for the reassessments. The analysis encompasses the 108 patients available for reassessment at six months (day</p>

Entry	Judgement	Support for judgement
Selective reporting (reporting bias)	Low risk	<p>hospital, 52; home physiotherapy, 56) and includes the five patients who changed treatment, who have been included in their original randomised treatment group.” (Young and Forster 1992: 1086)</p> <p>6 months: 2/54 missing from day hospital group and 2/58 missing from home physiotherapy group due to death or new stroke.</p> <p>“Intention to treat analysis: all patients, regardless of compliance with protocol, were included.” (Young 1991: 286)</p> <p>Comment: Respectively 4% and 3% attrition.</p> <p>The methodology specified only two measures, i.e. age and Barthel Index that has been reported on in subsequent studies (Young and Foster 1991a).</p>

APPENDIX B. SUMMARY OF STUDIES WITH EVIDENCE ON HOME-BASED PHYSIOTHERAPY

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	Barnett 2003  South Western Sydney, Australia.  Home-based	N=163  Intervention (n=83)  Control (n=81)  Community-dwelling elderly, at risk for falling  Age > 60 yrs	Intervention: Weekly group exercise programme with ancillary home exercises over one year (mean 23 exercise session)  Control group: same written information about falls prevention but no alternative 'non-exercise' activity.	Standard assessment screen by GP or PT of Physical performance and General health:  Measures of Strength  Postural sway on the floor with eyes open and eyes closed  Coordinated stability reaction time  Walking speed  SF 36  Physical activity  Scale for the Elderly; Fear of falling scales	Improved significantly on :  - postural sway on the floor with eyes open - and eyes closed - and coordinated stability  12 months: 40% less falls (IRR=0.60, 95% CI 0.36–0.99).



	Study	Participants	Intervention/ Comparison	Outcomes	Results
				Baseline, 6 months, 12 months (postal survey)	
	Barrett 2002  Sydney, Australia	N=40  Community-based progressive resistance training program (n = 20)  Flexibility program (n = 20)	Intervention: One hour twice weekly for 10 weeks  Control: non-specific exercise program with a focus on flexibility	Strength,;  Gait;  Balance;  SF-36 (QoL).	Progressive resistance training had a greater effect than flexibility training on right sided quadriceps strength (mean difference between groups = 7.7%; 95% CI 3.6-11.8%, $p < 0.003$ MANOVA);  Left sided quadriceps strength (mean difference = 9.9%; 95% CI 5.6-14.2%, $p < 0.003$ MANOVA);  Left sided biceps strength (mean difference = 15.2%; 95% CI 11.7-19.2%, $p < 0.003$ MANOVA), Functional reach (mean difference = 11.7%; 95% CI 7.1-16.3%, $p < 0.003$ MANOVA);  Step test (mean difference = 8.6%; 95% CI 3.8-13.4%, $p < 0.003$ MANOVA).
	Beech 1999	N = 331	Intervention: Early discharge to	Patient utilisation of	Inpatient stay days (intervention group)

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	<p>Inner-London, UK</p> <p>Discharged from the teaching hospital, St Thomas's.</p>	<p>Early discharge package (n=137),</p> <p>Conventional care (n=194).</p>	<p>home care;</p> <p>Control: Normal discharge.</p>	<p>health and social services over a 12-month period;</p> <p>Cost.</p>	<p>versus 18 days (controls) (<math>P&lt;0.0001</math>).</p> <p>Average units of therapy per patient: PT: 22.4 (early discharge) versus 15.0 (conventional) (<math>P&lt;0.0006</math>);</p> <p>OT: 29.0 versus 23.8 (<math>P&lt;0.002</math>);</p> <p>ST: 13.7 versus 5.8 (<math>P&lt;0.0001</math>). The early discharge group: more annual hospital physician contacts (<math>P&lt;0.015</math>) and general practitioner clinic visits (<math>P&lt;0.019</math>); but</p> <p>Fewer incidences of day hospital attendance (<math>P&lt;0.04</math>).</p> <p>Other differences in utilization were non-significant.</p> <p>Average annual costs per patient were £6800 (early discharge) and £7432 (conventional).</p> <p>The early discharge group had lower in-patient costs per patient (£4862 [71% of total cost] versus £6343 [85%] for controls) but</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
					<p>higher non-inpatient costs (£1938 [29%] versus £1089 [15%]).</p> <p>Early discharge is unlikely to lead to financial savings; its main benefit is to release capacity for an expansion in stroke caseload.</p>
	<p>Brach 2004</p> <p>Pittsburgh and surrounding areas, America.</p> <p>Rural/urban community.</p>	<p>N=229</p> <p>Women</p> <p>(1) aged 50 to 65 years,</p> <p>(2) at least 1 year after cessation of menses;</p> <p>(3) abstention from oestrogen therapy; and</p> <p>(4) no physical limitations that might preclude walking.</p>	<p>Intervention: Walking (achieve and maintain a minimum walking distance of 11.2 km/week (7 miles/week)).</p> <p>Walked on their own or with one of the walking groups that was organised by the study exercise leaders</p> <p>Control: ?No walking</p>	<p>Paffenbarger questionnaire (modified version);</p> <p>Self-report: FSQQ;</p> <p>The two activities of daily living (ADL) sections of the FSQ, basic and instrumental ADLs;</p> <p>Objective physical activity: Large-scale integrated (LSI) monitor; Pedometer;</p>	<p>Subjective and objective measures of physical activity independently predicted gait after controlling for age, chronic conditions, and activity limitation (subjective model-adjusted <math>R^2=0.09</math> [<math>P=.03</math>]; and objective model-adjusted <math>R^2=0.13</math> [<math>P=.008</math>]).</p> <p>The consistency of physical activity was also related to functional status. Women who were always active had the best functional status.</p> <p>Women who were always inactive had the worst functional status.</p> <p>For difficulty with activities of daily living:</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
		<p>Classified by the basic and instrumental ADL sections of the FSQ:</p> <p>No ADL\any ADL difficulty (i.e., reporting difficulty on at least one of the basic or instrumental ADL items).</p>		<p>LSI activity monitor;</p> <p>A 7-day average of the number of steps taken per day;</p> <p>PPT;</p> <p>GaitMat II analysis system.</p>	<p>Those always active, 17 (37.8%) of 45 women;</p> <p>Those inconsistently active, 24 (40.0%) of 60 women; and</p> <p>Those always inactive, 39 (59.1%) of 66 women (for trend <math>P=.02</math>).</p> <p>Score on the Physical Performance Test:</p> <p>Those always active, 24.9;</p> <p>Those inconsistently active, 24.5; and</p> <p>Those always inactive, 23.8</p> <p>(Analysis of variance with linear contrasts <math>P=.04</math>).</p> <p>Gait speed:</p> <p>Those always active, 1.17 m/s;</p> <p>Those inconsistently active, 1.15 m/s; and</p> <p>Those always inactive, 1.03 m/s (analysis of</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
					variance with linear contrasts $P=.002$ ).
	<p>Burch 1999</p> <p>Orchard Centre day hospital at Hinchingsbrooke Hospital, and social services day centres in Huntingdon (Hunters Down) and St Neots (The Hillings).</p> <p>Mainly rural health district. Day hospital and social services day centres in market towns.</p>	<p>N=105</p> <p>Day hospital rehabilitation (n=50);</p> <p>Day care centre (n=55);</p> <p>Physically disabled older patients living at home;</p> <p>Patients were: excluded (a) if they suffered from dysphasia assessed by the Boston</p>	<p>Day hospital treatment :</p> <p>Day centre rehabilitation by a PT and two health support workers</p> <p>“([A]ctive and Passive exercise programme. The only equipment available was a Bobath plinth, a standing frame and a Flotron for treatment of oedema. Patients were also instructed in the use of aids and stairs.”</p> <p>(OT</p> <p>“PT: instructions in walking, transfers and stairs. They also received treatment with equipment which was not available at the day centres, including heat, ice,</p>	<p>BI;</p> <p>Philadelphia Geriatric Morale scale;</p> <p>Caregiver Strain index</p> <p>Home assessments at baseline (twice), 6 weeks and 3 months.</p>	<p>More day centre (23/55) than day hospital patients (6/50) (<math>P&lt;0.001</math>) withdrew from allocated treatment;</p> <p>Both groups improved significantly in functional ability and reduction of care-giver strain by three months, but no significant difference between groups. The mean improvement in BI (standard error) for day hospital = +1.5 (0.41) (<math>n = 34</math>) and day centres = +1.5 (0.48) (<math>n = 38</math>);</p> <p>The mean difference (95%CI) between day hospital and day centre was 0 (−1.28, 1.28);</p> <p>The mean Philadelphia Geriatric Morale Scale improvement for day hospital +1.8 (0.66) (<math>n = 35</math>) and day centres was +0.9 (0.63) (<math>n = 38</math>).</p> <p>The mean difference was −0.88 (−2.7, +0.95);</p> <p>The mean reduction in Caregiver Strain for day hospital was −1.45 (0.5) (<math>n = 23</math>) and day</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
		aphasia scale cartoon; if the multidisciplinary team thought that they required (b) nursing, (c) a medical procedure or drug monitoring, (d) treatment more than twice a week, or (e) specific, focused occupational therapy (for example for hand movements).	ultrasound, parallel bars and an Argo lifting and mechanical aid."		centre was $-1.59 (0.47)$ ( $n = 27$ ). The difference was $-0.14 (1.52, +1.24)$ .
	Ciaschini 2009	N=201	Immediate Intervention protocol: Patient education: patient-specific evidence-based recommendations	Primary: Falls risk assessment at 6	6 months: No difference between groups. At 12 months, the number of falls in the

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	<p>Algoma District of Ontario, Canada, a geographically vast area with Sault Ste Marie (population 78,000) as its main city.</p> <p>Group Health Centre (GHC), a not-for-profit health service community centre, in partnership with Sault Area Hospital (SAH), a facility with 250 active beds.</p>	<p>Intervention (n=100); Usual care (n=101)</p> <p>Community-dwelling, aged ≥55 years (mean 72) and identified to be at risk for fall-related fractures.</p> <p>Included based on Berg Balance Scale: the InterRAI Screener, A medication review: assessment for orthostatic hypotension.</p>	<p>targeted to reduce falls risk to both the patients and their primary care providers. Included strengthening exercises, gait and balance training and referral to activities such as T'ai Chi classes.</p> <p>OT: home environmental assessment; Cognitive testing.</p>	<p>months.</p> <p>Secondary: Hospital admissions related to falls; Fractures at 6 and 12 months.</p> <p>Baseline: Assessment of falls risk, functional status and home environment.</p>	<p>intervention group was greater than in the usual care group [23% (23/101) vs 11% (11/100); RR 2.07, 95% CI 1.07–4.02].</p> <p>Increased assessment by PT and OT.</p>
	Ciaschini 2010				

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	Gill 2004  General community: home based, Connecticut	N=188  intervention: 6-month, home-based training program, (n=94)  Control : 6-monthly home visits from a trained health educator (n=94)  >75 years  Physically frail  Persons were ineligible for the study if they were non-ambulatory,	Intervention: A home-based PT program (i.e., pre-habilitation) that focused primarily on improving underlying impairments in physical capabilities.  Control: Health education home- visits  45 and 60 minutes, several content  areas in general health practices and health promotion, including proper nutrition, management of medications, physical activity  Progressive, competency-based exercises were developed for joint Range of Motion (RoM), balance, and muscle conditioning and strengthening (with Theraband	Physical frailty (  -5 self-reported IADLs, (including shopping for groceries, meal preparation, housework, laundry, and getting to places beyond walking distance)  Mobility:  Timed rapid gait,  Timed chair stands  Modified POMA  Cognitive status  Age, sex, race, living situation, education, and 10 physician-diagnosed chronic conditions:	“At 7 months, the differences between treatment groups were statistically significant for IADL disability, timed rapid gait, and the modified POMA.” (p. 1048)  “Statistically significant differences were observed at 12 months for timed chair stands and for the modified PPT but not for the other 3 outcomes.” (p. 1048)  Other variables did not differ significantly.



	Study	Participants	Intervention/ Comparison	Outcomes	Results
		<p>were receiving PT or participating in an exercise program, did not speak English, had a diagnosis of dementia or scored less than 20 on the MMSE, had a life expectancy of less than 12 months, or had had a stroke, hip fracture, hip or knee replacement, or myocardial infarction within the past 6 months.</p>	<p>elastic bands).  Initially under supervision, followed by six monthly phone calls.  Baseline  7 months  12 months</p>	<p>hypertension, myocardial infarction, congestive heart failure, stroke, diabetes, arthritis, hip fracture, chronic lung disease, cirrhosis or liver disease, and cancer (other than minor skin cancers).</p>	
	<p>Gitlin 2006  Philadelphia, USA</p>	<p>N=319  Intervention (n=160);</p>	<p>OT (four 90-minute visits and one 20-minute telephone contact) and PT (one 90 min visit):  Home modifications (grab bars,</p>	<p>Self-rated functional difficulties with ambulation:  IADL;</p>	<p>At 6 months, intervention participants had less difficulty than controls with instrumental activities of daily living (P=04) and activities of daily living (P&lt;.03), with</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	Urban community-living older people	<p>No-intervention (n=159)</p> <p>Adults aged &gt;70</p> <p>Cognitively intact;</p> <p>Not receiving home care;</p> <p>Reported the need for help or difficulties with two instrumental ADLs (IADL) or one or more ADLs</p>	<p>rails, raised toilet seats), and training in their use;</p> <p>Instruction in strategies of problem-solving, energy conservation, safe performance, and fall recovery techniques;</p> <p>Balance training;</p> <p>Muscle strength training.</p> <p>Control: At 12-month educational materials on home safety and safe performance techniques.</p>	<p>ADL;</p> <p>Fear of falling;</p> <p>Confidence performing daily tasks;</p> <p>Use of adaptive strategies. Observations of home hazards.</p>	<p>largest reductions in bathing (P&lt;.02) and toileting (P&lt;0.049)</p> <p>Greater self-efficacy (P&lt;.03)</p> <p>Less fear of falling (P&lt;.001)</p> <p>Fewer home hazards (P&lt;.05,) and Greater use of adaptive strategies (P&lt;.009)</p> <p>Benefits were sustained at 12 months for most outcomes.</p>
	<p>Gitlin 2009</p> <p>SAME STUDY as Gitlin 2006</p>	<p>See Gitlin 2006</p> <p>Stratified according to baseline mortality risk.</p>	<p>See Gitlin 2006</p> <p>The maintenance phase (from 6–12 months) consisted of three brief OT telephone calls to reinforce strategy</p>	<p>Survival time</p>	<p>At 2 years, intervention participants (n=160) had a 5.6% mortality rate (n=9 deaths) and controls (n=159) a 13.2% rate (n=21 deaths; P&lt;.02).</p> <p>At 2 years, intervention participants with moderate mortality risk had a 16.7% mortality</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
			use and to help generalise use to newly identified problems. In a final home visit, occupational therapists reviewed and reinforced strategies and obtained closure.		rate (n=16 deaths/96), compared with 28.2% for equivalent control group participants (n=24 deaths/85; P<0.02).  By 3 years, mortality rates were not statistically significantly different between the experimental and control groups.  At 3.5 years from study entry the mortality rate was lower in the experimental group.
	Grant 2005  Calgary, Canada	N=145  Home-based (n=73);  PT group (n=72)  Age: 16 to 59 years  Full range of motion, minimise swelling, and	All patients followed the same standardised rehabilitation programme over 3 months  Home-based patients: minimally supervised PT (attended 4 PT sessions)  PT supervised group attended 17 PT sessions over the first 12 weeks after surgery.	RoM  Sagittal plane knee laxity (KT arthrometer)  Peak quadriceps torque (Cybex)  Peak hamstrings torque (Cybex)  Baseline (preoperatively) <sup>6</sup>	The home-based group had a significantly higher percentage of patients with acceptable flexion and extension RoM compared to the standard physical therapy group (flexion, 67% vs 47%; extension, 97% vs 83%).  No significant differences between the groups in RoM during walking, ligament laxity, and strength.

	Study	Participants	Intervention/ Comparison	Outcomes	Results
		offset strength deficits due to pain/swelling, ACL reconstruction with a bone–patellar tendon–bone autograft	Control: 2 sessions per week for weeks 2 through 7 and once per week for weeks 8 through 12 after surgery for a total of 17 sessions within the first 3 postoperative months.	weeks, and  at 12 weeks postoperatively.	
	Green 2002  Bradford, UK  Homes/Community-based centres	N=170  Usual Rx (n=85)  No treatment (n=85)  1 year post stroke  >50 years	PT: established community physiotherapy service (13 staff) usual care.  Maximum contact period of 13 weeks  Minimum of three contacts per patient  .	Rivermead mobility index  Secondary:  Gait speed  Number of falls  BI  Social activity  Frenchay activities index:	Changes in scores on the Rivermead mobility index (score) (range 0–15) differed significantly between groups at 3 months (p=0.018), but only by a median of 1 point (95% CI 0–1), with an interpolated value of 0.55 (0.08–1.04).  Gait speed was 26 m/min (0.30–4.95) higher in the treatment group at 3 months. Neither treatment effect persisted at 6-months' and 9-months' follow-up.  Treatment had no effect on patients' daily

	Study	Participants	Intervention/ Comparison	Outcomes	Results
				HAD  GHQ28  Baseline, 3, 6, and 9 months	activity, social activity, anxiety, depression, and number of falls, or on emotional stress of carers.
	Green 2004  Oxford, UK (Cross-over RCT)  Combined with Green 2002 (Bradford, UK)	N=364  See Green 2022  Oxford (n=94)  Bradford (n= 170)	See Green 2002  Intervention given in both studies was at the discretion of the physiotherapists and was of similar and low intensity (mean visits Oxford = 4 (SD 2.5); Bradford = 5 (SD 4.5)).	See Green 2002	Mobility at 3 months in the combined treatment group significant but clinically small improvement measured by the Rivermead Mobility index (median of the differences (95% confidence interval (CI) 0, 1);interpolated values 0.43 (95% CI 0.08, 0.80)) and  Gait speed (treatment effect 2.7 m/min (95% CI 0.94, 4.46).  No other significant differences.

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	Hesse 2011	N=50	Group A (n=25)	Primary:	A and B patients equally improved functions over time.
	Berlin, Germany	Group A (n=25)	received three two-month blocks of therapy at home (months 1 and 2, months 5 and 6, months 9 and 10), each block contained four 30 to 45-minute sessions per week, totalling 96 sessions.	Rivermead Mobility index	N between group differences.
	Community dwelling	Group B(n=25)	Group B (n=25) continuously received two 30 to 45 minute sessions per week, totalling 104 sessions.	Secondary:	The initial (terminal) Rivermead Mobility Index was 9.4_2.8 (12.2_2.1) in Group A, and 8.5_3.5 (11.2_2.7) in Group B.
		First-time stroke, discharged home, following inpatient Rehabilitation.	Bobath and motor relearning	Stair climbing velocity	More Group B patients fell seriously (7 versus 1).
			Specific motor functions which the patient and caregiver had named as relevant for their daily life, e.g.	Time up and go test	
				Modified Ashworth scale:	
				Lower limb spasticity	
				Upper- and lower-limb motor functions	
				Box and Block test	
				Rivermead Activities of Daily Living	
				Number of falls	

	Study	Participants	Intervention/ Comparison	Outcomes	Results
			<p>climbing up- and downstairs, walking in- and outside the house, bath and toilet use, passing traffic lights, shopping etc.</p> <p>Other blocks: self-programme - various stretching, strengthening and motor tasks every workday for at least 30 minutes.</p> <p>Patients were phoned every 14 days.</p> <p>Group B patients: Usual care two times per week 30 to 45, eclectic approach.</p>		
	<p>Jessep 2009</p> <p>Outpatient physiotherapy</p>	<p>N=65</p> <p>ESCAPE programme (n=29);</p>	<p>“Enabling Self-management and Coping with Arthritic knee Pain through Exercise” (ESCAPE-knee pain programme) (integrated rehabilitation programme that</p>	<p>Primary :  WOMAC</p>	<p>Both groups demonstrated similar improvements in clinical outcomes.</p> <p>Outpatient physiotherapy:</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	department and community centre.  UK	Out-patients (n=35)  > 50 years  Consulted a primary care physician for mild, moderate or severe non-specific knee pain lasting for more than 6 months with no identifiable recent cause.	combined exercise, patient education, self-management and coping strategies).  Outpatient physiotherapy	Secondary outcomes:  WOMAC-Pain;  AFPT of four common ADLs; Exercise-related health beliefs and self-efficacy;  HAD;  EQ-5D;  CSRI.  Baseline, immediately after the intervention and 12 months later.	Cost £130 per person;  Healthcare utilisation costs over 1 year were £583.  The ESCAPE-knee pain programme:  Cost £64 per person and the healthcare;  Utilisation costs of participants over 1 year were £320.
	Kuisma 2002	N=81	Study received average of 4.6 sessions of PT.  The control group received average	PAAF with five categories:  (a) Community ambulatory;	Both groups improved in ambulation.  Neither group achieved their pre-ambulatory status



	Study	Participants	Intervention/ Comparison	Outcomes	Results
	<p>Hong Kong, China</p> <p>Home-care and Rehabilitation Centre</p>	<p>Home-based care (n=40);</p> <p>Control group: Rehabilitation Centre (n=41)</p> <p>Hip fractures</p> <p>The mean age of the subjects was 75 years (SD 8.3 years).</p> <p>Exclusion for safety: concomitant serious, conditions, living alone or spend more than 4 hours alone during the day.</p>	<p>36.2 days (SD 14.6) sessions daily conventional institution-based PT.</p>	<p>(b) Household ambulatory;</p> <p>(c) Walking on flat surface;</p> <p>(d) Transfer from bed to chair;</p> <p>(e) Bed/chair bound.</p> <p>Baseline, one year later.</p>	<p>The study group achieved significantly higher ambulation scores (<math>P &lt; 0.05</math>) for community and household ambulation compared a year after surgery.</p>
	<p>Lin 2004</p>	<p>N=19</p>	<p>Home-based PT once a week for 10 weeks once a week 50 to 60</p>	<p>Bl;</p>	<p>At 11 weeks, Group I showed greater improvement in lower limb motor function</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	Nan-Tou County, Taiwan  Home-based care	Immediate PT (n=9);  Later PT (n=10).	minutes: motor facilitation, postural control training, functional ambulation training with gait correction, and ADL training, caregiver counselling to foster compliance.  Tailor-made to the individual.	ADL;  STREAM;  Baseline, 11 weeks, 22 weeks.	than Group II.  At 22 weeks, the between-group differences were not significant.
	Lord 2008  New Zealand  Three hospitals and three community settings	N=30  Intervention in the community (n=14) by PT assistants;  Hospital outpatients (n=16) by PTs;  Post-acute, home-dwelling stroke survivors.	The community intervention: whole task practice of functional gait in different settings tailored to each participant by PT assistants (Maximum of two PT visits).  Hospital-based:  Motor Relearning approach (balance activities, open and closed-chain exercises, practice of selective components of the gait cycle, walking tasks and treadmill	Primary:  10 MTW  Secondary:  6 MWT;  ABCS;  Subjective Index of Physical and Social Outcomes	Both groups: Large gains in gait speed  community group mean (SD) 16 (16.1) m/min; physiotherapy group mean (SD) 15.9 (16.1) m/min, maintained at six months.  (However, the average gait speed only just approximates the 48 m/min suggested minimum speed for independent community mobility, and the average distance walked in 6 minutes still fell short of the recommended 300 m.)

	Study	Participants	Intervention/ Comparison	Outcomes	Results
			training).  PT twice a week for seven weeks.	Baseline (post intervention), 6 months.	No significant differences between groups for primary and secondary outcomes after treatment (P=0.86 ANOVA) or at six months (P=0.83 ANOVA). Only 11 participants reported independent community ambulation.  Levels of social integration were low to moderate.
	Luuken 2007  City of Oulu, Finland  Home Care.	N=555  Community Intervention (n=217);  Out-patient Intervention (n=220);  Aged >85 years  recurrent (>2) falls during the preceding	Plan developed by PT and OT based on risk factors  Home exercise (highest priority);  Walking;  Group activities; or  Self-care exercise or  Routine care.	Incidence of falling;  Risk of falling;  Grip strength;  BMI;  Blood pressure;  Cognitive status;  Balance;	The time to first four falls and all falls did not significantly differ between the groups.  Hazard ratio 0.88 (95% CI 0.74 to 1.04) and 0.93 (0.80–1.09), respectively.  Among those able to move outdoors,  Hazard ratios (intervention group (N=168) compared to the controls (N=178): 0.78 (0.64–0.94) and 0.88 (0.74–1.05).  Impaired balance less common in the intervention than in the control subjects; 64

	Study	Participants	Intervention/ Comparison	Outcomes	Results
		year, frequent feelings of loneliness, poor self-rated health, poor visual acuity, poor hearing, depression, poor cognition, impaired balance, impaired chair rise and slow walking speed.	Control: No intervention; visited physician.	Rise up from a chair; Walking speed; Number of prescribed medications; Use of health services; Physical exercise Home exercise: frequency and duration; Walking; Group exercise.  Median of 16 months during intervention.	(45%) and 89 (59%) ( $p < 0.05$ ).
	Miller 2011	N=30	Intervention: twice weekly, home-based PT for eight weeks by experienced domiciliary PT.	Primary: MSIS29	A minimum of 58 subjects per group are required to achieve a power of 80% at the 5% level of significance based on the MSIS29. A

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	<p>Ayrshire and Arran, UK</p> <p>Community; subjects' homes.</p>	<p>Intervention (n=15)</p> <p>Control (n=15)</p> <p>Moderate to severe primary or secondary progressive multiple sclerosis (MS)</p> <p>Included based on EDSS</p> <p>Adequate cognitive function (At least three identifiable PT goals)</p> <p>Excluded: rapidly progressing disease, and already in</p>	<p>Control: usual care.</p>	<p>Secondary:</p> <p>EDSS;</p> <p>Physical impairment, MS symptoms;</p> <p>Leeds MS Quality of Life Scale;</p> <p>MS-related symptom checklist;</p> <p>Brief Pain Inventory – Short form;</p> <p>HAD;</p> <p>Muscle strength lower limb (Dynamometer);</p> <p>10MTW;</p>	<p>larger scale study is required.</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
		PT;  Additional neurological conditions or other medical conditions which would preclude them taking part in the study.		Timed Sit to Stand;  Disability.  Baseline, week 8, week 16	
	Mitchell 2004  UK  Homes (four primary care trust areas) and physiotherapy outpatients in a South Yorkshire teaching hospital trust	N=130  Intervention (home) group  (n=65);  Control (hospital outpatient) group  (n=65).  Osteoarthritis patients waiting for unilateral Total Knee Replacement (TKR)	Intervention: pre- and post-operative home visits for Intervention: Assessment and treatment by a community PT.  Minimum three pre-operative visits;  Up to six post-discharge visits.  Pre-operative physiotherapy, based on an initial assessment, typically included pain relief, techniques to increase knee flexion and extension, gait re-education and home/functional adaptations.  Postoperative physiotherapy additionally included techniques to reduce swelling and mobilise soft	HRQoL;  WOMAC;  SF-36;  Patient satisfaction;  NHS resource use  NHS Cost estimate  Client cost estimate  Pre-op, 12 weeks post-op	No significant differences were observed between the two. No significant differences in WOMAC, WOMAC pain score, or any other HRQoL score.  Home group had a significantly greater mean number of PT sessions [mean difference 5.2 sessions, 95% CI=-6.3 to -4.1; P=0.001].  No significant difference in the total NHS costs per patient. However, home physiotherapy for TKR was significantly more expensive (mean difference -£136.5, 95% CI=-£160 to -113; P=0.001);  Equally satisfied;

	Study	Participants	Intervention/ Comparison	Outcomes	Results
		<p>Revision procedures, bilateral or unicondylar KR, TKR</p> <p>following severe trauma</p> <p>Exclusion:</p> <p>Onset of serious co-morbidity or terminal illness which necessitates cancellation or considerable delay in treatment</p> <p>Contra-lateral KR within the preceding 12 months</p>	<p>tissues.</p> <p>Usual hospital post-discharge</p> <p>Only: group exercises in knee classes of seven to 10 patients in the gymnasium; usually once or twice a week.</p> <p>Individual treatment: techniques to increase knee flexion and extension, electrotherapy for pain relief and/or muscle stimulation; gait re-education.</p>		<p>More of the home group would choose their location for physiotherapy again.</p>
	Moffett 2004				
	Munneke 2010	N= 699	Intervention:	Primary	The primary endpoint was similar for patients within the ParkinsonNet clusters (mean 47.7,

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	<p>Cluster randomised</p> <p>Clusters formed by all Parkinson's Disease patients living in the communities connected to participating regional hospitals in 16 clusters, in the Netherlands</p>	<p>Implementation of ParkNet (n=358); Usual-care clusters (n=341).</p> <p>Parkinson's Disease</p>	<p>Development of a network of dedicated physiotherapist with specific expertise in Parkinson's Disease and structured referrals to these ParkNet therapists by neurologists.</p> <p>Control: Usual Care</p> <p>Baseline and at 8, 16, and 24 weeks</p>	<p>Modified MACTAR scale</p> <p>Secondary:</p> <p>Parkinson's Activity Scale</p> <p>Costs</p> <p>Proportion of correct referrals</p> <p>Secondary</p> <p>Quality of PT</p> <p>Incidence of falls</p> <p>ADLDS</p> <p>EQ-SD</p> <p>Patient and PT satisfaction</p> <p>Freezing of gait</p>	<p>SD 21.9) and control clusters (48.3, 22.4).</p> <p>Health secondary endpoints were also similar</p> <p>Total costs over 24 weeks were lower in ParkinsonNet clusters compared with usual-care clusters (difference €727; 95% CI 56–1399).</p>



	Study	Participants	Intervention/ Comparison	Outcomes	Results
				questionnaire 6-m walk test 4X3-m walk test Single leg stance Timed up and GO Falls Efficacy Scale 9-hole peg hole test HADS LAPAQ Caregiver Strain Index PDQ-39	
	O'Shea 2007  Queensland, Australia	N=54  Experimental (n=27) (19 completed);	Six progressive resistance exercises three times a week (once in hospital out-patients under PT supervision, twice independently at home) for 12 weeks	Muscle strength Chronic Respiratory Disease questionnaire; 6 MWT	By 12 weeks improved K ext by 4,9 kg (95% CI 1.1 to 8.7)  Experimental group clinically significant decrease in dyspnoea

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	3 regional services and one metropolitan hospital	Control (n=27) (22 completed).  COPD not undergoing pulmonary rehabilitation in past 12 months.  Stable (spirometry: FVC, FEV <sub>1</sub> , FEV <sub>1</sub> /FVC, FEV <sub>1</sub> % predicted)	Control: No intervention	Timed Up and Go test;  Grocery Shelving test;  Patient-Specific Functional scale;  London Handicap scale.   6, 12, 18 and 24 months	Neither maintained by week 12  No difference in other outcomes  44% of experimental group unable to complete the trial. NB
	Pang 2005  Vancouver, British Columbia, Canada  Community-based.  Data collection:	N=63  Intervention group (n=32);  Control group (n=31).  >50 years older	Intervention group:  Fitness and mobility exercise (FAME) programme designed to improve cardiorespiratory fitness, mobility, leg muscle strength, balance, and hip BMD (1-hour sessions, three sessions/week, for 19 weeks in groups of 9 to 12 supervised by PT, OT, Exercise therapist)	VO <sub>2</sub> max;  6 MWT;  16-point Borg Rating of Perceived Exertion Scale;  Blood pressure;  Respiratory exchange ratio;	The intervention group significantly more gains in cardiorespiratory fitness, mobility, and paretic leg muscle strength than controls.  Femoral neck BMD of the paretic leg was maintained in the intervention group, whereas a significant decline of the same occurred in controls.  No significant time-by-group interaction for balance, activity and participation, nonparetic leg muscle strength, or non-paretic femoral

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	research laboratory located in a rehabilitation hospital.	individuals with chronic stroke (post stroke duration >1 year) who were living in the community.	Control group: seated upper extremity programme.  No aerobic exercises, leg strengthening, or balance training were given.	Isometric knee extension;  Berg Balance Scale;  Physical Activity Scale for Individuals with Physical Disabilities;  Femoral neck BMD.	neck BMD.
	Ravaud, Giraudeau, Logeart, Larguier, Rolland, Treves et al "Management of OA with an unsupervised home based exercise programme and/ or patient administered assessment tools.				
	Wolf 2000  South London, UK	N=43  Rehabilitation team (n=23);	Rehabilitation at home by rehabilitation team for up to three months (The mean number of PT sessions was three (range 1 to 14)  Maximum one visit per therapist	Primary:  Bl.  Secondary:	Experimental group more likely to have OT, PT, ST ( $p = 0.03, 0.01$ and $0.008$ , respectively).  Experimental group outcome was non-significantly higher ( $0.05 < p < 0.2$ ) for:  Nottingham Health Profile, anxiety,

	Study	Participants	Intervention/ Comparison	Outcomes	Results
	<p>Patients' homes</p> <p>Outpatient resources available</p> <p>in the district</p> <p>resources.</p>	<p>Control ('usual' care) (n=20).</p> <p>Stroke patients not admitted to hospital after a stroke.</p>	<p>per day.</p> <p>Control: usual care. (mean two sessions)</p>	<p>Motricity Index;</p> <p>Mini-Mental State Examination;</p> <p>Albert Test;</p> <p>Frenchay Aphasia</p> <p>FAST;</p> <p>Modified BI;</p> <p>Rivermead Activities of Daily Living score;</p> <p>HAD;</p> <p>5 MTW;</p> <p>NHP;</p> <p>Caregiver Strain Index;</p> <p>Three questions about speech;</p> <p>Service utilisation.</p>	<p>depression, caregiver strain and the proportion of patients living at home.</p> <p>Experimental group had more CT scans who were in touch with the rehabilitation team had more (<math>p = 0.26</math>).</p> <p>150 patients in each arm would be needed to have adequate power to detect a 33% difference between the two groups.</p>

	Study	Participants	Intervention/ Comparison	Outcomes	Results
				At 2, 4, 6 months	
	<p>Young 1992</p> <p>Bradford, UK</p> <p>Four day hospitals in two health authorities and domiciliary work undertaken by experienced community physiotherapists.</p>	<p>N=124</p> <p>N=108 by 6 months</p> <p>Home-based (n=63) (By 6 months = 52)</p> <p>Day-hospital-based (n=61) (By six months = 56)</p> <p>&gt;60 years discharged home after a new stroke with residual disability.</p>	<p>Home-based treatment by community physiotherapy;</p> <p>Treatment at a day hospital twice a week.</p>	<p>BI;</p> <p>functional ambulatory categories;</p> <p>Motor Club assessment;</p> <p>Frenchay activities index;</p> <p>NHP;</p> <p>Carers' stress:</p> <p>GHQ-28;</p> <p>Community care.</p>	<p>Both groups had significantly improved in functional abilities by six months.</p> <p>The improvements were significantly greater for patients treated at home (Mann-Whitney test; BI median difference 2 (95% CI 0 to 3) p=0.01;</p> <p>Motor Club assessment, median difference 2 (1 to 5), p=.01).</p> <p>Analysis of the functional ambulatory categories scores showed significantly more patients in the home treated group were in category 5, able to walk outside on uneven ground and slopes (day hospital group 23%; home physiotherapy 45%; <math>\chi^2=4.65</math>, P=0.03).</p> <p>The home treated patients received less treatment (median difference 16 (11 to 21) treatments, P&lt;0.001).</p> <p>More than a third of patients in both groups showed depressed mood, and a quarter of care givers were emotionally distressed.</p>

<sup>a</sup> Explanation of abbreviations in the table. 5 MTW: 5-metre timed walk test; 6 MWT: 6-minute walk test; 10 MTW: 10-minute timed walk test; ABCS: Activities-specific Confidence Balance scale; ADL: Activities of daily living; AFPT Aggregated functional performance time; ATE: aerobic training exercise; BADL: Basic activities of daily living; BI: Barthel Index; BMD: Bone mineral density; BMI: Body Mass index; CI: Confidence Interval; COPD: Chronic Obstructive Pulmonary Disease; CRDQ : Chronic Respiratory Disease questionnaire; CSRI : Client Services Receipt Inventory; EDSS: The Extended Disability Status score; ESCAPE: Enabling Self-management and Coping with Arthritic Knee Pain through Exercise programme; EQ-5D : EuroQual Health-related Quality of Life instrument; FAST: Frenchay Aphasia Screening test; FSQ: Functional Status questionnaire; GHQ-28: The general health questionnaire; GP: General practitioner; HAD: Hospital Anxiety and Depression scale; HRQoL: Health-related Quality of Life; IADL: Instrumental activity of daily living; MMSE: Mini-Mental State Examination; MSIS29: Multiple Sclerosis Impact scale; NHP: Nottingham Health Profile; NHS: National Health System; OT: Occupational therapy; PAAF: Patients admission and assessment form; PPT: Physical Performance test; PT: Physiotherapy; QoL: Quality of Life; RoM: range of motion; RTE: resistance training exercise; SF-36: Short Form 36; ST: Speech therapy; STREAM: Stroke Rehabilitation Assessment of Movement; VO<sub>2</sub>max: Maximum oxygen consumption; WHOQOL-BREF: World Health Organization Quality of Life Measure – Abbreviated version; WOMAC: Western Ontario and McMaster Universities Osteoarthritis index;

APPENDIX C. DELPHI ROUND-1 QUESTIONNAIRE

# Delpi Round 1

## The development of core standards for undergraduate education for community physiotherapy in South Africa

The aim of the study is to reach consensus on core standards of education for community physiotherapy in South Africa. The results would help universities to appropriately prepare physiotherapy graduates to deliver relevant services to the South African population.

In THIS PART of the study a list of roles and functions of community physiotherapists, and important themes, will be determined. You are an important source of information on this topic and will be asked to comment on the IDEAL situation from your point of view, and not on what the current situation is.

Completing the survey will take about ten to twenty minutes. Participation is entirely voluntary and without compensation.

All information that you give is anonymous. No link can be made between your answers and your e-mail address.

Don't hesitate to [Email Me](#).

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Cell: +27 (0)82 312 7159

The study has ethics approval (12/2010). Completing the survey implies informed consent. Select the button to continue.

### \*Where do you mainly work?

#### Select one option below

- South Africa
- Other Southern African country
- Other African country
- Other (please specify)

### \*In which province do you mainly work?

#### Select one option from the drop-down menu.

Province:



## Delpi Round 1

### \*Where in Southern Africa do you mainly work?

#### Select one option

- Angola
- Botswana
- Lesotho
- Mozambique
- Namibia
- Swaziland
- Zimbabwe
- Other (please specify)

### \*Where in Africa do you work?

#### Select one option from the drop-down menu

Country:

If you selected "Other", please specify here

### \*Where do you currently work or have worked before? (You may select more than one option)

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Non-governmental organisation          | <input type="checkbox"/> Sport centre                    | <input type="checkbox"/> District hospital                      |
| <input type="checkbox"/> Disabled People Organisation           | <input type="checkbox"/> Home for the Elderly            | <input type="checkbox"/> Regional hospital                      |
| <input type="checkbox"/> Provincial Government Department       | <input type="checkbox"/> Luncheon club                   | <input type="checkbox"/> Provincial hospital                    |
| <input type="checkbox"/> National Government Department         | <input type="checkbox"/> Protective workshop             | <input type="checkbox"/> Tertiary hospital                      |
| <input type="checkbox"/> School for children with special needs | <input type="checkbox"/> Prison                          | <input type="checkbox"/> Specialist hospital (e.g. Psychiatric) |
| <input type="checkbox"/> Primary school                         | <input type="checkbox"/> Domiciliary service/Home visits | <input type="checkbox"/> Private practice                       |
| <input type="checkbox"/> Secondary school                       | <input type="checkbox"/> Community Centre                | <input type="checkbox"/> University                             |
| <input type="checkbox"/> Hospice                                | <input type="checkbox"/> Clinic                          |   |
| <input type="checkbox"/> Care centre                            | <input type="checkbox"/> Rehabilitation Centre           |   |
| <input type="checkbox"/> Other (please specify)                 |  |   |

## Delpi Round 1

### \*What is your profession?

#### Select one option

- Physiotherapist
- Occupational therapist
- Speech and/or hearing therapist
- Psychologist
- Other (please specify)
- Social worker
- Nurse
- Medical doctor

### \*Please select one of the following options:

- I am busy with compulsory community service
- I did community service earlier
- I qualified before 2003 and did not serve
- Not applicable

### \*In which year did you complete your compulsory service?

#### Select an option from the drop-down menu

Year

Completed in:

### \*Please indicate your gender.

#### Select an option below

- Male
- Female

## Delpi Round 1

10. Below is a description of community physiotherapy. In the text box after the description please:

a) add to the description, and/or

b) indicate where you disagree.

Community physiotherapy covers comprehensive health care with the overarching aim of the protection and promotion of health and wellness of human communities. The primary responsibility of the community physiotherapist is to the population, although services are also directed to groups, families and individual clients. A population or community can be a geographical area, such as a health district, or a group of clients, e.g. all those with disabilities in a province.

Community physiotherapy takes place in the health sector, as well as in other settings like schools and industry.

In community-based rehabilitation projects physiotherapists contribute to health care, e.g. health promotion, prevention of disability, medical care, rehabilitation and the provision of assistive devices like wheelchairs. In addition, they facilitate, in partnership, empowerment of persons with disabilities, e.g. through social mobilisation, and working with self-help groups and disabled people organisations(DPOs).

Education about health is an essential component of community physiotherapy to promote self-responsibility by addressing risk factors of lifestyle diseases. For example, the lack of physical activity is a contributing factor in common conditions like HIV/AIDS, stroke, cardiovascular disease, cancer and depression. As exercise experts, physiotherapists, for example, initiate exercise classes in a variety of settings, e.g. at luncheon clubs, to promote a physically active lifestyle.

A community physiotherapist combines the theory and practice of physiotherapy, public health and community development.

**Please type your comments in the text box:**

# Delpi Round 1

**\*In your opinion and experience -**

**List the most important ROLES and/or FUNCTIONS that a physiotherapist should fulfil in a community setting (outside of hospitals and private practice rooms) in the South African context. Also list THEMES that should be addressed in the curriculum.**

**Think of the IDEAL situation.**

**Type your comments in the text boxes below (three categories)**

In general:

2

3

4

5

More:

In public health:

1

2

3

4

5

More:

In community  
development:

1

2

3

4

5

More:

Any other comments:

## Delpi Round 1

### \*In what sector is your MAIN job?

#### Select one option

- Not-for-profit (e.g. The National Council for the Physically Disabled; the Leprosy Mission)
- Public (e.g. a government hospital or state department)
- Private (e.g. a private hospital or home for the elderly)

### \*What is your MAIN professional role?

#### Select one option

- Work hands-on with patients
- Manage and/or develop and monitor policy
- Teach health care professionals at a tertiary institution
- Do research
- Other (please specify)

### \*What is your professional status as a clinician?

#### Select one option

- Junior (public sector)
- Senior (Public sector)
- More Senior (Public sector, e.g. assistant director)
- Employee in private practice
- Practice owner
- Other (please specify)

## Delpi Round 1

**\*At what level do you carry out your management / policy-making role?**

**Select one option**

- Department
- Hospital
- District
- Region
- Province
- National
- Other (please specify)

**\*When were you born?**

**Type the year in the text box**

(e.g. 1962)

**\*What is your highest qualification?**

**Please select an option from the drop-down menu**

Highest qualification

Highest

(Not part of the survey).

**You are welcome to nominate possible participants (either with experience in community-based and/or public health, and/or in curriculum development.)**

APPENDIX D. DELPHI ROUND-2 QUESTIONNAIRE

## Delpi Round 2

### Information and consent

#### **Community and Public Health Physiotherapy Competencies**

The aim of the study is to develop standards of education on community and public health physiotherapy in South Africa. The results will help to revise the curriculum to appropriately prepare physiotherapy graduates to deliver relevant services to the South African population. Findings will be available to other training institutions.

Participation is entirely voluntary and without compensation. The study has ethics approval (12/2010). All information that you give will be treated confidentially.

Please don't hesitate to contact me:

[Email Me](#) (Wait for the e-mail to open).

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Fax: +27 (0)12 354 1226

Cell: +27 (0)82 312 7159

Please comment on the IDEAL situation, and not necessarily how it is currently.

Select the button to continue.

### Clinical Prevention and Health Promotion



## Delpi Round 2

### 1. The physiotherapy graduate applies screening, counselling and preventative interventions to identify and modify risk factors, and promote healthy living in clients, groups and populations, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	Don't know
a) Screen for (biopsychosocial and environmental) risk factors using appropriate approaches to testing to successfully identify potential causes of injury, disease or disability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Plan, organise, implement, monitor and evaluate projects to address prevalent risk factors, e.g. tobacco smoking and sedentary lifestyles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Develop and manage wellness and lifestyle programmes, e.g. exercise programmes and involvement at sports clubs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Counsel patients to adopt healthy behaviours, e.g. using brief motivational interviews, counselling skills and telehealth skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Facilitate self-responsibility for health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Conduct education and training in different formats to different target groups ranging from individual clients and caregivers to populations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Identify and refer clients who must be immunised	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comment(s)

## Health Systems and Health Policy

## Delpi Round 2

### 2. The physiotherapy graduate organises and manages clinical and public health services, contribute to health policy development, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly Agree	Don't know
a) Explain and work within the structures of the public health system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Understand and fulfil his/her role as physiotherapist in primary health care and the district system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Link with the private and non-governmental sectors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Set up and manage clinical health services for individuals and populations, balancing individual with population needs: 1. mobile services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. home programmes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. community-based rehabilitation programmes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. satellite screening clinics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. physiotherapy departments (in clinics and hospitals)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. rehabilitation facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. long-term facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. palliative care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Market physiotherapy to consumers, management and colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Assure the quality, safety and accessibility (especially for persons with disabilities) of health services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Understand methods of financing health care institutions and services, locally and internationally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Financially manage projects, programmes, services and/or departments, e.g. compile budgets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Compile a basic balance sheet and interpret one	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Compile requests and/or orders for procurement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Delpi Round 2

according to relevant regulations/policies

k) Assure a competent physiotherapy and rehabilitation public health and personal healthcare workforce

l) Manage human resources in physiotherapy services, e.g. job descriptions and performance appraisal

m) Work effectively with volunteers

n) Train community members to become mid-level workers, like rehabilitation facilitators

o) Supervise and work with physiotherapy assistants

p) Motivate for programme-specific funding

q) Respond to disasters and assist communities in recovery, e.g. with rehabilitation of those with spinal cord injuries after an earthquake

r) Understand the process of health policy making, e.g. on departmental, district, provincial and national level

s) Liaise with government departments at different levels

t) Develop policies and plans, e.g. advocacy, advisory and consulting processes that support individual and community health efforts

u) Enforce laws and regulations that protect health and ensure safety

Comment(s)

## Population Health

## Delpi Round 2

### 3. The physiotherapy graduate contributes to the health of populations, educating and serving populations, and enhancing environmental and occupational health, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	Don't know
a) Monitor health status to identify physiotherapy-related community health problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Diagnose and investigate health problems and health hazards in the community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Asses community strengths and needs, and map assets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Inform, educate and empower populations, e.g. using mass media like radio broadcasts, press releases, health days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Mobilise community partnerships to identify and solve health problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Apply strategies to build community capacity in partnerships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Negotiate entry into communities and partnerships for health care, including a broad network of community leaders and community-based organisations, like religious organisations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Assess and manage risks, and prevent injury, disease and disability in susceptible populations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Link people to needed personal health services and assure the provision of health care when otherwise unavailable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Advocate for the assessment and management of environmental risks, e.g. air pollution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) Prevent and control of occupational exposure, e.g. physical overstrain and injuries, also in health care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Delpi Round 2

settings

Comment(s)

### Other Aspects of Community Practice

#### 4. The physiotherapist contributes to community development , act as an agent of change, promote integration of persons with disability into society, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	Don't know
a) Explain and address socio-economic impacts on health and functioning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Influence the impact of policies on health care and health outcomes including impacts on vulnerable populations, like persons who are homeless and/or with disabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Understand the role of and work with international organisation, e.g. WHO, non-governmental organisations (e.g. hospices), Disabled People Organisations, private foundations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Explain and use the International Classification System of Health and Functioning (ICF)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Be responsive to the special needs of the South African population when managing physiotherapy services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Promote social justice, e.g. fair distribution of physiotherapy services and access to services	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Establish social upliftment programmes and community-driven projects designed to create positive social change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Contribute to ameliorate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Delpi Round 2

the effects of poverty

i) Explain and address the impact of disability in different environments, and constraints which it imposes on clients, their families and communities

j) Set up support systems

k) Address social and physical barriers that prevent participation by persons with disabilities

l) Provide leadership in public health programmes in partnership with local action committees, awareness raising events to diminish stigmatisation due to disability

m) Arrange for the supply and maintenance of assistive devices, ortho- and prostheses

n) Facilitate equality of opportunities for persons with disabilities and reintegration into society, e.g. advocating for integration of children with disabilities into mainstream schools

o) Use low-cost technology where appropriate

Comment(s) (Optional)

## Clinical Practice

## Delpi Round 2

### 5. The graduate physiotherapist applies clinical skills to treat acute and mainly chronic conditions of all the body systems, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	Don't know
a) Facilitate the achievement of optimum patient independence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Identify and use the most appropriate interventions and techniques based on the findings of assessment, social context, pathology and evidence for practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Adapt to work in different settings and with different age groups, from children to the elderly, in diverse rural and urban populations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comment(s)

## Evidence-based Practice

## Delpi Round 2

### 6. The physiotherapy graduate can find and gather, appraise and use evidence to provide and evaluate care to individuals, communities and populations, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	Don't know
a) Find and use different types and sources of physiotherapy, health and disability data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Identify priority determinants of health and health care that contributes to the burden of disease	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Evaluate research based on the samples, methods, presentation of data, and analysis to identify effective, beneficial physiotherapy practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Interpret biostatistical data to estimate the effect of treatment, e.g. relative risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Implement recommendations from evidence-based clinical guidelines related to clinical prevention, community- and population-based physiotherapy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Use appropriate specific, and general (quality of life, social integration, etc) outcomes to evaluate clinical physiotherapy and population interventions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Evaluate health information, e.g. websites, mass media, patient information (taking levels of health literacy and cultural appropriateness into account)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Research for new insights and innovative solutions to physiotherapy-related problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comment(s) (Optional)



# Delpi Round 2

## Communication and Collaboration

### 7. The physiotherapy graduate collaborates and communicates in culturally sensitive ways with different clients and stakeholders to enhance health, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	Don't know
a) Communicate with clients and families in a respectful way, and involve them in decision-making, get informed consent before and during interventions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Interview and counsel clients effectively during a consultation in settings like the client's home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Communicate effectively with clients with low levels of health literacy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Act in a culturally sensitive and competent manner with clients and co-workers, accepting and respecting diversity within and between different cultural groups and genders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Use interpreters in multi-language settings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Understand group dynamics, and form and work with groups, e.g. self-help groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Plan, develop and conduct teaching sessions, using varied approaches, for clients, care-givers, colleagues, community groups, educators/teachers and community leaders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Develop effective educational materials, e.g. posters and information brochures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Apply the principles of adult education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Use skills, such as team building, negotiation,	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Delpi Round 2

conflict management and group facilitation, to build partnerships

k) Work in multi-, inter-, and transdisciplinary, as well as multi-sectoral teams

l) Coach and mentor colleagues

m) Provides constructive, timely and specific feedback based on observation of performance

n) Write effectively, e.g. patient reports, funding applications, project plans

o) Use information technology efficiently and effectively

Comment(s) (Optional)

## Professionalism

## Delpi Round 2

### 8. The physiotherapy graduate acts professionally, legally and is sensitive to the rights of clients, and demonstrates the ability to:

(Please indicate your level of agreement with each of the competencies listed below)

	1 Strongly disagree	2	3	4	5	6 Strongly agree	7 Don't know
a) Explain the history, philosophy, roles and responsibilities of physiotherapy as a profession, and apply these in public health and community-based settings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Reflect on her/his own values, beliefs and actions and identify goals for personal development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Comply with policy, regulatory and legal requirements, e.g. registration with the statutory body (HPCSA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Employ the values of professionalism, like altruism and commitment to serve society, and ethical and moral standards in providing physiotherapy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Be aware of own strengths and weaknesses, and consult colleagues when necessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Act as a first-line professional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Manage own stress and time, and be resilient when confronted with challenges	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Be open to and participate in peer appraisal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Identify, analyse and solve ethical issues related to physiotherapy practice, e.g. use frameworks for decision making in public health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Understand and comply with professional and ethical codes to support human rights	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k) Think critically and in a systemic way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l) Facilitate change in complex systems like a physiotherapy service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Delpi Round 2

Comment(s) (Optional)

### Work setting

#### 9. Where do you currently work or have worked before? (You may select more than one option)

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Non-governmental organisation          | <input type="checkbox"/> Sport centre                    | <input type="checkbox"/> District hospital                      |
| <input type="checkbox"/> Disabled People Organisation           | <input type="checkbox"/> Home for the Elderly            | <input type="checkbox"/> Regional hospital                      |
| <input type="checkbox"/> Provincial Government Department       | <input type="checkbox"/> Luncheon club                   | <input type="checkbox"/> Provincial hospital                    |
| <input type="checkbox"/> National Government Department         | <input type="checkbox"/> Protective workshop             | <input type="checkbox"/> Tertiary hospital                      |
| <input type="checkbox"/> School for children with special needs | <input type="checkbox"/> Prison                          | <input type="checkbox"/> Specialist hospital (e.g. Psychiatric) |
| <input type="checkbox"/> Primary school                         | <input type="checkbox"/> Domiciliary service/Home visits | <input type="checkbox"/> Private practice                       |
| <input type="checkbox"/> Secondary school                       | <input type="checkbox"/> Community Centre                | <input type="checkbox"/> University                             |
| <input type="checkbox"/> Hospice                                | <input type="checkbox"/> Clinic                          |   |
| <input type="checkbox"/> Care centre                            | <input type="checkbox"/> Rehabilitation Centre           |   |
| <input type="checkbox"/> Comment(s)                             |  |   |

### Other Demographics (last screen)

#### 10. What is your MAIN professional role?

##### Select one option

- Work hands-on with patients
- Manage and/or develop and monitor policy
- Teach health care professionals at a tertiary institution
- Do research
- Other (please specify)

## Delpi Round 2

### 11. At what level do you carry out your management / policy-making role?

#### Select one option

- Department
- Hospital
- District
- Region
- Province
- National
- Other (please specify)

### 12. Please select one of the following options:

- I am busy with compulsory community service
- I did community service earlier
- I qualified before 2003 and did not serve
- Not applicable

### 13. What is your highest qualification?

#### Please select an option from the drop-down menu

Highest qualification

Highest

### 14. Please select your gender

- Female
- Male

### 15. Any other comments or suggestions?

APPENDIX E. DELPHI ROUND-3 QUESTIONNAIRE

## Delpi Round 3

### Information and consent

#### **Community and Public Health Physiotherapy Competencies: Teaching and Assessng**

Thank you for your willingness to share your insights. Participation is entirely voluntary and without compensation. The study has ethics approval (12/2010). All information that you give will be treated confidentially.

Findings from the study would help to identify (1) appropriate teaching-and-learning, and (2) assessment strategies in community and public health physiotherapy.

The questionnaire consists of EIGHT competency domains: professionalism, communication and collaboration, clinical prevention, health systems and health policy, population health, other aspects of community health, evidence-based practice and clinical practice. These domains represent the roles of professional, communicator, collaborator, health promotor, manager and leader, population health practitioner and health advocate, community developer, scholar and clinical expert.

Please don't hesitate to contact us:

[Email Me](#) (Wait for the e-mail to open).

Office tel: +27 (0)12 354 1353

Fax: +27 (0)12 354 1226

Cell: +27 (0)82 312 7159

Select the "Next" button below to continue.

### Professionalism

## Delpi Round 3

**1. Please give ideas about teaching-and-learning and assessment - in professionalism - in the text boxes below.**

**The physiotherapy graduate acts professionally, legally and is sensitive to the rights of clients,**

**and demonstrates the ability to:**

- a) Comply with policy, regulatory and legal requirements, e.g. registration with the statutory body (HPCSA) (97% agreement)**
- b) Understand and comply with professional and ethical codes to support human rights (97% agreement)**
- c) Employ the values of professionalism, like altruism and commitment to serve society, and ethical and moral standards in providing physiotherapy (96% agreement)**
- d) Be aware of own strengths and weaknesses, and consult colleagues when necessary (95% agreement)**
- e) Be aware of own strengths and weaknesses, and consult colleagues when necessary (95% agreement)**
- f) Manage own stress and time, and be resilient when confronted with challenges (94% agreement)**
- g) Think critically and in a systemic way (94% agreement)**
- h) Identify, analyse and solve ethical issues related to physiotherapy practice, e.g. use frameworks for decision making in public health (93% agreement)**
- i) Reflect on her/his own values, beliefs and actions and identify goals for personal development (92% agreement)**
- j) Explain the history, philosophy, roles and responsibilities of physiotherapy as a profession, and apply these in public health and community-based settings (90% agreement)**
- k) Facilitate change in complex systems like a physiotherapy service (90% agreement)**

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct observation, video/audio recording, peer review, written assignment, group educational meeting, interaction with supervisor,



## Delpi Round 3

written self-reflection)

### Communication and Collaboration

**2. Please give ideas about teaching-and-learning and assessment - in communication and collaboration - in the text boxes below.**

**The physiotherapy graduate**

**collaborates and communicates in culturally sensitive ways with different clients, team members and stakeholders to enhance health,**

**and demonstrates the ability to:**

- a) Communicate with clients and families in a respectful way, and involve them in decision-making, get informed consent before and during interventions (97% agreement)**
- b) Develop effective educational materials, e.g. posters and information brochures**
- c) Use information technology efficiently and effectively (96% agreement)**
- d) Plan, develop and conduct teaching sessions, using varied approaches, for clients, care-givers, colleagues, community groups, educators/teachers and community leaders (95%% agreement)**
- e) Coach and mentor colleagues (93%% agreement)**
- f) Act in a culturally sensitive and competent manner with clients and co-workers, accepting and respecting diversity within and between different cultural groups and genders (92% agreement)**
- g) Work in multi-, inter-, and transdisciplinary, as well as multi-sectoral teams (92% agreement)**
- h) Communicate effectively with clients with low levels of health literacy (92% agreement))**
- i) Write effectively, e.g. patient reports, funding applications, project plans (92% agreement)**
- j) Interview and counsel clients effectively during a consultation in settings like the client's home (91% agreement)**
- k) Provides constructive, timely and specific feedback based on observation of performance (91% agreement))**
- l) Apply the principles of adult education (87%% agreement)**
- m) Use interpreters in multi-language settings (87% agreement)**
- n) Understand group dynamics, and form and work with groups, e.g. self-help groups (87% agreement)**
- o) Use skills, such as team building, negotiation, conflict management and group**

## Delpi Round 3

### facilitation, to build partnerships (85% % agreement)

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct observation, video/audio recording, peer review, written assignment, group educational meeting, interaction with supervisor, written self-reflection)

### Clinical Prevention (Role: Health Promoter)

## Delpi Round 3

**3. Please give ideas about teaching-and-learning and assessment - in clinical prevention / health promotion - in the text boxes below.**

### **The physiotherapy graduate**

**applies screening, counselling and preventative interventions to identify and modify risk factors, and promotes healthy living in clients, groups and populations,**

**and demonstrates the ability to:**

**a) Conduct education and training in different formats to different target groups ranging from individual clients and caregivers to populations (94% agreement)**

**b) Facilitate self-responsibility for health (% agreement)**

**c) Develop and manage wellness and lifestyle programmes (% agreement)**

**d) Counsel patients to adopt healthy behaviours, e.g. using brief motivational interviews, counselling skills and telehealth skills (% agreement)**

**e) Screen for (biopsychosocial and environmental) risk factors using appropriate approaches to testing to successfully identify potential causes of injury, disease or disability (84% agreement)**

**f) Plan, organise, implement, monitor and evaluate projects to address prevalent risk factors (79% agreement)**

A. What would be the best teaching-and-learning strategies for this domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess competencies in this domain? (e.g. direct observation, video/audio recording, peer review, written assignment, group educational meeting, interaction with supervisor, written self-reflection)

## Health Systems and Health Policy (Roles: Manager and Leader)

## Delpi Round 3

**4. Please give ideas about teaching-and-learning and assessment - in managing and leading in health systems - in the text boxes below.**

### **The physiotherapy graduate**

**organises and manages clinical and public health services, contributes to health policy development,**

**and demonstrates the ability to:**

**a) Set up and manage clinical health services for individuals and populations, balancing individual with population needs:**

**1. home programmes (98% agreement)**

**2. physiotherapy departments (in clinics and hospitals) (94% agreement)**

**3. rehabilitation facilities (94% agreement)**

**4. community-based rehabilitation programmes (86% agreement)**

**5. long-term facilities (84% agreement)**

**6. palliative care (79% agreement)**

**7. satellite screening clinics (77% agreement)**

**8. mobile services (77% agreement)**

**b) Understand and fulfil his/her role as physiotherapist in primary health care and the district system (92% agreement)**

**e) Market physiotherapy to consumers, management and colleagues (88% agreement)**

**d) Explain and work within the structures of the public health system (88% agreement)**

**e) Supervise and work with physiotherapy assistants (87% agreement)**

**f) Work effectively with volunteers (86% agreement)**

**g) Assure the quality, safety and accessibility (especially for persons with disabilities) of health services (82% agreement)**

**h) Assure a competent physiotherapy and rehabilitation public health and personal healthcare workforce (82% agreement)**

**i) Manage human resources in physiotherapy services, e.g. job descriptions and performance appraisal (78% agreement)**

**j) Motivate for programme-specific funding (71% agreement)**

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct observation, video/audio recording, peer review,

## Delpi Round 3

written assignment, group  
educational meeting,  
interaction with supervisor,  
written self-reflection)

### Population Health (Population Health Practitioner and Health Advocate)

**5. Please give ideas about teaching-and-learning and assessment - in population health - in the text boxes below.**

#### **The physiotherapy graduate**

**contributes to the health of populations, educates and serves populations, and enhances environmental and occupational health,**

**and demonstrates the ability to:**

**a) Monitor health status to identify physiotherapy-related community health problems (84% agreement)**

**b) Link people to needed personal health services and assure the provision of health care when otherwise unavailable (78% agreement)**

**c) Assess community strengths and needs, and map assets (78% agreement)**

**d) Diagnose and investigate health problems and health hazards in the community (78% agreement)**

**e) Prevent and control of occupational exposure, e.g. physical overstrain and injuries, also in health care settings (77% agreement)**

**f) Inform, educate and empower populations, e.g. using mass media like radio broadcasts, press releases, health days (77% agreement)**

**g) Assess and manage risks, and prevent injury, disease and disability in susceptible populations (73% agreement)**

**h) Mobilise community partnerships to identify and solve health problems (72% agreement)**

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct observation, video/audio recording, peer review,

## Delpi Round 3

written assignment, group  
educational meeting,  
interaction with supervisor,  
written self-reflection)

### Other Aspects of Community Care (Community developer)

**6. Please give ideas about teaching-and-learning and assessment - in community development - in the text boxes below.**

#### **The physiotherapy graduate**

**contributes to community development, acts as an agent of change, promotes the integration of persons with disability into society,**

**and demonstrates the ability to:**

**a) Arrange for the supply and maintenance of assistive devices, ortho- and prostheses (92% agreement)**

**b) Be responsive to the special needs of the South African population when managing physiotherapy services (89% agreement)**

**c) Explain and address the impact of disability in different environments, and constraints which it imposes on clients, their families and communities (82% agreement)**

**d) Use low-cost technology where appropriate (82% agreement)**

**e) Explain and use the International Classification System of Health and Functioning (ICF) (81% agreement)**

**f) Promote social justice, e.g. fair distribution of physiotherapy services and access to services (80% agreement)**

**g) Address social and physical barriers that prevent participation by persons with disabilities (80% agreement)**

**h) Explain and address socio-economic impacts on health and functioning (80% agreement)**

**i) Set up support systems (77% agreement)**

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct

## Delpi Round 3

observation, video/audio recording, peer review, written assignment, group educational meeting, interaction with supervisor, written self-reflection)

### Evidence-based Practice (Scholar)

**7. Please give ideas about teaching-and-learning and assessment - in evidence-based practice - in the text boxes below.**

**The physiotherapy graduate**

**finds and gathers, appraises and uses evidence to provide and evaluate care to individuals, communities and populations,**

**and demonstrates the ability to:**

- a) Find and use different types and sources of physiotherapy, health and disability data (91% agreement)**
- b) Implement recommendations from evidence-based clinical guidelines related to clinical prevention, community- and population-based physiotherapy (91% agreement)**
- c) Evaluate health information, e.g. websites, mass media, patient information (taking levels of health literacy and cultural appropriateness into account) (90% agreement)**
- d) Use appropriate specific, and general (quality of life, social integration, etc) outcomes to evaluate clinical physiotherapy and population interventions (89% agreement)**
- e) Research for new insights and innovative solutions to physiotherapy-related problems (89% agreement)**
- f) Evaluate research based on the samples, methods, presentation of data, and analysis to identify effective, beneficial physiotherapy practice (86% agreement)**
- g) Interpret biostatistical data to estimate the effect of treatment, e.g. relative risk (80% agreement)**
- h) Identify priority determinants of health and health care that contributes to the burden of disease (79% agreement)**

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct

## Delpi Round 3

observation, video/audio recording, peer review, written assignment, group educational meeting, interaction with supervisor, written self-reflection)

### Clinical Practice (Role: Clinical expert)

**8. Please give ideas about teaching-and-learning and assessment - in clinical practice in community settings - in the text boxes below.**

#### **The physiotherapy graduate**

**applies clinical skills to treat acute and mainly chronic conditions of all the body systems,**

**and demonstrates the ability to:**

**a) Facilitate the achievement of optimum patient independence (97% agreement)**

**b) Identify and use the most appropriate interventions and techniques based on the findings of assessment, social context, pathology and evidence for practice (97% agreement)**

**c) Adapt to work in different settings and with different age groups, from children to the elderly, in diverse rural and urban populations (96% agreement)**

A. What would be the best teaching-and-learning strategies for this competency domain? (e.g. reflective diary, assignment, lecture, field visit, case study, scenario-study)

B. What would be the best way(s) to assess this competency? (e.g. direct observation, video/audio recording, peer review, written assignment, group educational meeting, interaction with supervisor, written self-reflection)

### Omitted (Less than 70% Agreement)



## Delpi Round 3

Criteria on which agreement were not reached, with the level of agreement in brackets:

- a) Respond to disasters and assist communities in recovery, e.g. with rehabilitation of those with spinal cord injuries after an earthquake (69% agreement)
- b) Train community members to become mid-level workers, like rehabilitation facilitators (69% agreement)
- c) Understand the process of health policy making, e.g. on departmental, district, provincial and national level (68% agreement)
- d) Compile requests and/or orders for procurement according to relevant regulations/policies (67% agreement)
- e) Negotiate entry into communities and partnerships for health care, including a broad network of community leaders and community-based organisations, like religious organisations (66% agreement)
- f) Influence the impact of policies on health care and health outcomes including impacts on vulnerable populations, like persons who are homeless and/or with disabilities (66% agreement)
- g) Develop policies and plans, e.g. advocacy, advisory and consulting processes that support individual and community health efforts (66% agreement)
- h) Liaise with government departments at different levels (66% agreement)
- i) Understand methods of financing health care institutions and services, locally and internationally (64% agreement)
- j) Apply strategies to build community capacity in partnerships (64% agreement)
- k) Enforce laws and regulations that protect health and ensure safety (63% agreement)
- l) Financially manage projects, programmes, services and/or departments, e.g. compile budgets (62% agreement)
- m) Contribute to ameliorate the effects of poverty (61% agreement)
- n) Advocate for the assessment and management of environmental risks, e.g. air pollution (61% agreement)
- o) Identify and refer clients who must be immunised (60% agreement)
- p) Compile a basic balance sheet and interpret one (60% agreement)

## Work setting

## Delpi Round 3

### 9. Where do you currently work or have worked before? (You may select more than one option)

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Non-governmental organisation          | <input type="checkbox"/> Sport centre                    | <input type="checkbox"/> District hospital                      |
| <input type="checkbox"/> Disabled people organisation           | <input type="checkbox"/> Home for the Elderly            | <input type="checkbox"/> Regional hospital                      |
| <input type="checkbox"/> Provincial government department       | <input type="checkbox"/> Luncheon club                   | <input type="checkbox"/> Provincial hospital                    |
| <input type="checkbox"/> National government department         | <input type="checkbox"/> Protective workshop             | <input type="checkbox"/> Tertiary hospital                      |
| <input type="checkbox"/> School for children with special needs | <input type="checkbox"/> Prison                          | <input type="checkbox"/> Specialist hospital (e.g. psychiatric) |
| <input type="checkbox"/> Primary school                         | <input type="checkbox"/> Domiciliary service/Home visits | <input type="checkbox"/> Private practice                       |
| <input type="checkbox"/> Secondary school                       | <input type="checkbox"/> Community centre                | <input type="checkbox"/> University                             |
| <input type="checkbox"/> Hospice                                | <input type="checkbox"/> Clinic                          |   |
| <input type="checkbox"/> Care centre                            | <input type="checkbox"/> Rehabilitation centre           |   |
| <input type="checkbox"/> Comment(s)                             |  |   |

## Other Demographics (last screen)

### 10. What is your MAIN professional role?

#### Select one option

- Work hands-on with patients
- Manage and/or develop and monitor policy
- Teach health care professionals at a tertiary institution
- Do research
- Other (please specify)

## Delpi Round 3

### 11. At what level do you carry out your management / policy-making role?

#### Select one option

- Department
- Hospital
- District
- Region
- Province
- National
- Other (please specify)

### 12. Please select one of the following options:

- I am busy with compulsory community service
- I did community service earlier
- I qualified before 2003 and did not serve
- Not applicable

### 13. What is your highest qualification?

#### Please select an option from the drop-down menu

Highest qualification

Highest

### 14. Please select your gender

- Female
- Male

### 15. Any other comments or suggestions?

APPENDIX F. E-MAIL INVITATION TO HEADS OF DEPARTMENTS

From: Karien Mostert

To: pstruthers@uwc.ac.za  
Date: 2008/12/03 04:51 AM  
Subject: Information on Community Physiotherapy  
Attachments: Information Leaflet .pdf

Dear Trish

Attached is information on an intended study to describe the current learning outcomes for community physiotherapy at the eight South African training institutions, as a first step in further clarifying what is required when training the 'model' community/public health physiotherapist.

I would highly appreciate it if you would e-mail me the following, which will be handled strictly confidentially while honouring your institution's copyright privileges:

- 1) Broad information on the curriculum; which complements the information on the SAQA website and your current departmental website.
- 2) Learning objectives/outcomes/competencies for subjects/modules/study units covering themes with a non-clinical focus, e.g. professional development, community development; OR any non-clinical element that you consider important in preparing students for work in a community setting.
- 3) Learning aims/outcomes/competencies for non-clinical/community-based/public health block(s) and assignments.

You may benefit directly, as I will provide you with the concept analysis and outcomes, which would enable us to each revise our curriculum (if necessary!) The integrated findings could form the basis for future debate about meeting the needs of relevant stakeholders in preparing relevantly trained physiotherapy graduates, who may appropriately and effectively enhance the health of the South African population.

If you delegate this request to another staff member(s), would you be so kind as to e-mail me his/her/their contact details (cc me)

I know that this is a hectic time, and appreciate your assistance even more.  
Kind regards

Karien

-----  
Karien Mostert (M Physiotherapy, MBACoordinator: Professional Development and Leadership, Community Engagement (including Service-Learning) and Community-based projects

Departement Fisioterapie / Department of Physiotherapy  
Kamer 3-71 Room 3-71)  
Skool van Gesondheidsorgwetenskappe / School of Health Care Sciences  
Fakulteit van Gesondheidswetenskappe / Faculty of Health Care Sciences  
Dr Savage rylaan / Road  
University of Pretoria  
South Africa

Tel: +27 12 3541353

Faks: +27 12 354 1226

e-pos/ e-mail: [karien.mostert@up.ac.za](mailto:karien.mostert@up.ac.za)



APPENDIX G. RESPONSE TO INVITATION EXAMPLE 1

**From:** "Nonceba Mbambo" <Nonceba.Mbambo@wits.ac.za>  
**To:** "Karien Mostert" <Karien.Mostert@up.ac.za>  
**Date:** 2008/12/03 08:14 AM  
**Subject:** RE: Information on Community Physiotherapy

Dear Karien

We would gladly like to assist you in your study but the timing is very bad. I don't think you will be able to get this information before January next year. We are in the process of packing and moving from this building and people are irritable as it is, coupled with tiredness of this time of the year. I suggest you remind us again early next year so that we can assist you.

Good luck with the study and kind regards.

Nonceba Mbambo  
Head: Physiotherapy Department  
University of the Witwatersrand  
Johannesburg  
Phone:+27 11 7173728  
Fax:+27 11 7173719  
Mobile:+27 82 8850041

---

From: Karien Mostert [mailto:Karien.Mostert@up.ac.za]  
Sent: 03 December 2008 04:55 AM  
To: Nonceba Mbambo  
Subject: Information on Community Physiotherapy

Dear Nonceba

Attached is information on an intended study to describe the current learning outcomes for community physiotherapy at the eight South African training institutions, as a first step in further clarifying what is required when training the 'model' community/public health physiotherapist.

I would highly appreciate it if you would e-mail me the following, which will be handled strictly confidentially while honouring your institution's copyright privileges:

- 1) Broad information on the curriculum; which complements the information on the SAQA website and your current departmental website.
- 2) Learning objectives/outcomes/competencies for subjects/modules/study units covering themes with a non-clinical focus, e.g. professional development, community development; OR any non-clinical element that you consider important in preparing students for work in a community setting.
- 3) Learning aims/outcomes/competencies for non-clinical/community-based/public health block(s) and assignments.

You may benefit directly, as I will provide you with the concept analysis and outcomes, which would enable us to each revise our curriculum (if necessary!) The integrated findings could form the basis for future debate about meeting the needs of relevant stakeholders in preparing relevantly trained physiotherapy graduates, who may appropriately and effectively enhance the health of the South African population.

If you delegate this request to another staff member(s), would you be so kind as to e-mail me his/her/their contact details (cc me)

I know that this is a hectic time, and appreciate your assistance even more.

Kind regards

APPENDIX H. RESPONSE TO INVITATION EXAMPLE 2

**From:** "Patricia Struthers" <pstruthers@uwc.ac.za>  
**To:** <Karien.Mostert@up.ac.za>  
**Date:** 2008/12/04 05:50 PM  
**Subject:** Re: Information on Community Physiotherapy  
**Attachments:** Part.001

Dear Karien

This is a hectic time of year in the department so I will get back to you when I can.

Kind regards

Trish

Patricia Struthers PhD

Assoc. Professor

Department of Physiotherapy

University of the Western Cape

Private Bag X17

Bellville 7535

South Africa

Ph work 27.21.9592542/3935

Fax work 27.21.9591217

email pstruthers@uwc.ac.za

APPENDIX I. FOLLOW UP E-MAIL EXAMPLE

**From:** Karien Mostert  
**To:** nonceba.mbambo@wits.ac.za  
**Date:** 2009/02/17 02:58 PM  
**Subject:** Fwd: RE: Information on Community Physiotherapy  
**Attachments:** Information Leaflet .pdf

Dear Nonceba

Congratulations with your PhD. Blessings also with your marriage. What a great way to start a new year.

I hope that the bulk of the "move" frustrations is something of the past... and that you are settling in to the academic year.

Herewith again my humble request for information on the community physiotherapy elements in your curriculum. If isolating them are time-consuming, you are most welcome to send me the entire curriculum.

Most appreciated

Karien

-----  
Karien Mostert Wentzel (Ms)  
M Physiotherapy, MBA  
Coordinator: Professional Development and Leadership, Community Engagement (including Service-Learning) and Community-based projects  
Kamer 3-71 Room 3-71  
Departement Fisioterapie / Department of Physiotherapy  
Skool van Gesondheidsorgwetenskappe / School of Health Care Sciences  
Fakulteit van Gesondheidswetenskappe / Faculty of Health Care Sciences  
Dr Savage rylaan / Road  
University of Pretoria  
South Africa

Tel: +27 12 3541353  
Faks: +27 12 354 1226  
e-pos/ e-mail: [karien.mostert@up.ac.za](mailto:karien.mostert@up.ac.za)

APPENDIX J. FINAL FOLLOW-UP E-MAIL

**From:** Karien Mostert  
**To:** pstruthers@uwc.ac.za  
**CC:** nmlenzana@uwc.ac.za  
**Date:** 2009/03/26 04:12 PM  
**Subject:** Fwd: Re: Information on Community Physiotherapy  
**Attachments:** Re: Information on Community Physiotherapy

Dear Trish

The e-mails below refers.

I have scaled down this phase to looking only at the community/ public health block studyguide/ clinical guide.

I have spoken briefly to Nondwe about this a few weeks ago, but I don't seem to be lucky to get her e-mail address correct. (Our mailservers have also been 'playing tricks' for a few weeks recently)

I would really appreciate it if you/she could send it to me, even if it is just the learning aims/outcomes/objectives for the block. I have all the other universities' info, and as soon as I have yours, I can complete the "report" and distribute it to everyone (Anonymous of course)

With much appreciation

Karien



APPENDIX K. ETHICS CLEARANCE CERTIFICATE 1

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federalwide Assurance. FWA 00002567, Approved dd 22 May 2002 and Expires 24 Jan 2009. IRB 0000 2235 IORG0001762 Approved dd Jan 2006 and Expires 21 Nov 2008.



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1908 - 2008



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences Research Ethics Committee

Fakulteit van Gesondheidswetenskappe Navorsingsetiekkomitee

**Date:** 3/06/2008

<b>PROTOCOL NO.</b>	<b>93/2008</b>
<b>PROTOCOL TITLE</b>	Learning outcomes in community physiotherapy in South African physiotherapy degree programmes.
<b>INVESTIGATOR</b>	<b>Principle Investigator:</b> Karien Mostert
<b>SUPERVISOR</b>	Dr FAM Wenhold (Co-supervisor still to be appointed)
<b>DEPARTMENT</b>	<b>Dept:</b> Physiotherapy HW Snyman South 3/75 <b>Phone:</b> 012 354 1353 <b>Fax:</b> 012 354 1226 <b>E-Mail:</b> <a href="mailto:karien.mostert@up.ac.za">karien.mostert@up.ac.za</a> <b>Cell:</b> 082312 7159
<b>STUDY DE.G.REE</b>	Baseline study for proposed Ph D (Physiotherapy)
<b>MEETING DATE</b> OF THIS STUDY	28/05/2008

**This Protocol and Informed Consent and all the attachments have been considered by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria on 28/05/2008 and found to be acceptable**

Advocate AG Nienaber	(female) BA (Hons) (Wits); LLB; LLM (UP); Dipl.Datometrics (UNISA)
*Prof V.O.L. Karusseit	MBChB; MFGP (SA); MMed (Chir); FCS (SA): Surgeon
*Prof M Kruger	(female) MB.ChB. (Pta); MMed. Pead. (Pret); PhD. (Leuven)
*Dr N K Likibi	MB.BCh; Med.Adviser (Gauteng Dept.of Health)
*Snr Sr J. Phatoli	(female) BCur (Et.Ai) Senior Nursing-Sister
*Dr L Schoeman	(female) BP harm, BA Hons (Psy), PhD
*Dr R Sommers	(female) MBChB; MMed (Int); MPhar.Med;
Mr Y Sikweyiya	MPH; Master Level Fellowship in Research Ethics; BSC (Health Promotions) Postgraduate Dip in Health Promotion
*Prof TJP Swart	BChD, MSc (Odont), MChD (Oral Path) Senior Specialist; Oral Pathology
*Dr A P van Der Walt	BChD, DGA (Pret) Director: Clinical Services of the Pretoria Academic Hospital
*Prof C W van Staden	MBChB; MMed (Psych); MD; FTCL; UPLM; Dept of Psychiatry

**DR R SOMMERS;** MBChB; MMed (Int); MPhar.Med.  
SECRETARIAT of the Faculty of Health Sciences Research Ethics  
Committee, University of Pretoria, Pretoria Academic Hospital

\*  
Members attending the meeting.

HW Snyman Building(South) level 2-34 ■ Private Bag X169 Pta. S.A. 0001 ■ Tel:(012)354 1330.  
Fax:0866515924 ■ 012-354 1367 ■ E-Mail:[manda@med.up.ac.za](mailto:manda@med.up.ac.za) ■ Web:<http://www.healthethics-up.co.za>

APPENDIX L. EXAMPLE LIST OF CODES AND QUOTES

**Codes-quotations list**

**Code-Filter: All**

---

HU: Studyguides Audit Learning Assessment  
File: [C:\AtlasMandjie\Study Guide Audit Assessment etc\Studyguides Audit Learning Assessment.hpr6]  
Edited by: Super  
Date/Time: 2013-05-30 12:43:32

---

**Code: Assessment task {14-0}**

**P 1: U6.rtf - 1:1 [] (58:58) (Super)**

Codes: [Assessment task] [Learning opportunities]  
No memos

**P 2: U8.rtf - 2:1 [bloктоets geleentheid (tuisbes..) (4:4) (Super)**

Codes: [Assessment task]  
No memos

bloктоets geleentheid (tuisbesoek en groepsaktiwiteit)

**P 2: U8.rtf - 2:2 [Deurlopende assessering van bl..] (15:15) (Super)**

Codes: [Assessment task]  
No memos

Deurlopende assessering van blok

**P 2: U8.rtf - 2:3 [Dokumentasie van Diensleer pro..] (21:21) (Super)**

Codes: [Assessment task]  
No memos

Dokumentasie van Diensleer projek

**P 2: U8.rtf - 2:4 [Elke groep studente sal hul de..] (23:23) (Super)**

Codes: [Assessment task]  
No memos

Elke groep studente sal hul deel van die Diensleer projek insluit by die portefeulje vir F

**P 3: U1.rtf - 3:5 [12 hours together for feedback..] (48:48) (Super)**

Codes: [Assessment task]  
No memos

12 hours together for feedback (oral presentation).

**P 5: U4.rtf - 5:1 [] (13:13) (Super)**

Codes: [Assessment task] [Learning opportunities]  
No memos

Etc.

APPENDIX M. ETHICS CLEARANCE CERTIFICATE 2

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.



**UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA**

- \* FWA 00002567. Approved dd 22 May 2002 and Expires 13 Jan 2012.
- \* IRB 0000 2235 IORG0001762 Approved dd Jan 2006 and Expires 13 Aug 2011.

Faculty of Health Sciences Research Ethics Committee  
Fakulteit Gesondheidswetenskappe Navorsingsetiekkomitee

**DATE: 1/02/2010**

PROTOCOL NO.	<b>12/2010</b>
PROTOCOL TITLE	Development of standards for undergraduate community physiotherapy education in South Africa
INVESTIGATOR	Principal Investigator: Ms K Mostert-Wentzel
SUPERVISOR	Prof A J Van Rooijen tania.vanrooijen@up.ac.za Prof J Frantz (University of the Western Cape)
DEPARTMENT	Dept: Physiotherapy E-Mail: karien.mostert@up.ac.za Phone: 012 354 1353 Fax: 012 354 1226 Mobile: 0823127159
STUDY DEGREE	PhD (Physiotherapy)
MEETING DATE	27/01/2010

The Protocol and/or Informed Consent Document were approved on 27/01/2010 by a properly constituted meeting of the Ethics Committee subject to the following conditions:

1. The approval is valid for 2 years period, and
2. The approval is conditional on the receipt of 6 monthly written Progress Reports, and
3. The approval is conditional on the research being conducted as stipulated by the details of the documents submitted to and approved by the Committee. In the event that a need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

*Members of the Research Ethics Committee:*

- |                     |  |
|---------------------|--|
| Prof VOL Karusseit  | MBChB; MFGP(SA); MMed(Chir); FCS(SA) - Surgeon   |
| Prof JA Ker         | MBChB; MMed(Int); MD – Vice-Dean (ex officio)  |
| Dr NK Likibi        | MBBCh – Representing Gauteng Department of Health)   |
| Prof TS Marcus      | (female) BSc(LSE), PhD (University of Lodz, Poland) – Social scientist   |
| Dr MP Mathebula     | Deputy CEO: Steve Biko Academic Hospital   |
| Prof A Nienaber     | (female) BA(Hons)(Wits); LLB; LLM(UP); PhD; Dipl.Datametrics (UNISA) – Legal advisor   |
| Mrs MC Nzeku        | (female) BSc(NUL); MSc(Biochem)(UCL, UK) – Community representative  |
| Snr Sr J Phatoli    | (female) BCur(Eet.A); BTec(Oncology Nursing Science) – Nursing representative  |
| Dr L Schoeman       | (female) B.Pharm, BA(Hons)(Psych), PhD – Chairperson: Subcommittee for students' research  |
| Mr Y Sikweyiya      | MPH; SARETI Fellowship in Research Ethics; SARETI ERCTP; BSc(Health Promotion)<br>Postgraduate Dip (Health Promotion) – Community representative |
| Dr R Sommers        | (female) MBChB; MMed(Int); MPharmMed – Deputy Chairperson  |
| Prof TJP Swart      | BChD, MSc (Odont), MChD (Oral Path), PGCHE – School of Dentistry representative  |
| Prof C W van Staden | MBChB; MMed (Psych); MD; FCPsych; FTCL; UPLM - Chairperson   |

**DR R SOMMERS**; MBChB; MMed(Int); MPharmMed.  
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

◆ Tel:012-3541330      ◆ Fax:012-3541367 / 0866515924      ◆ E-Mail: [manda@med.up.ac.za](mailto:manda@med.up.ac.za)  
◆ Web: //www.healthethics-up.co.za      ◆ H W Snyman Bld (South) Level 2-34      ◆ P.O.BOX 667, Pretoria, S.A., 0001

APPENDIX N. E-MAIL TO INVITE INPUT ON THE MODEL

[Email]

**To:**

**From:** "karien.mostert@up.ac.za via surveymonkey.com" <member@surveymonkey.com>

**Subject:** Compulsory Community Model

**Body:** Dear [FirstName],

I would appreciate your comment on a model that we developed previously.

The link below gives access to a four-part model and a brief description. The whole survey comprises ONE text box and two demographic questions.

You find the link here <https://www.surveymonkey.com/s.aspx>

Your input would be very valuable to invigorate the curriculum

Karien

Please note: If you do not wish to receive further emails from me, please click the link below, and you will be automatically removed from our mailing list.

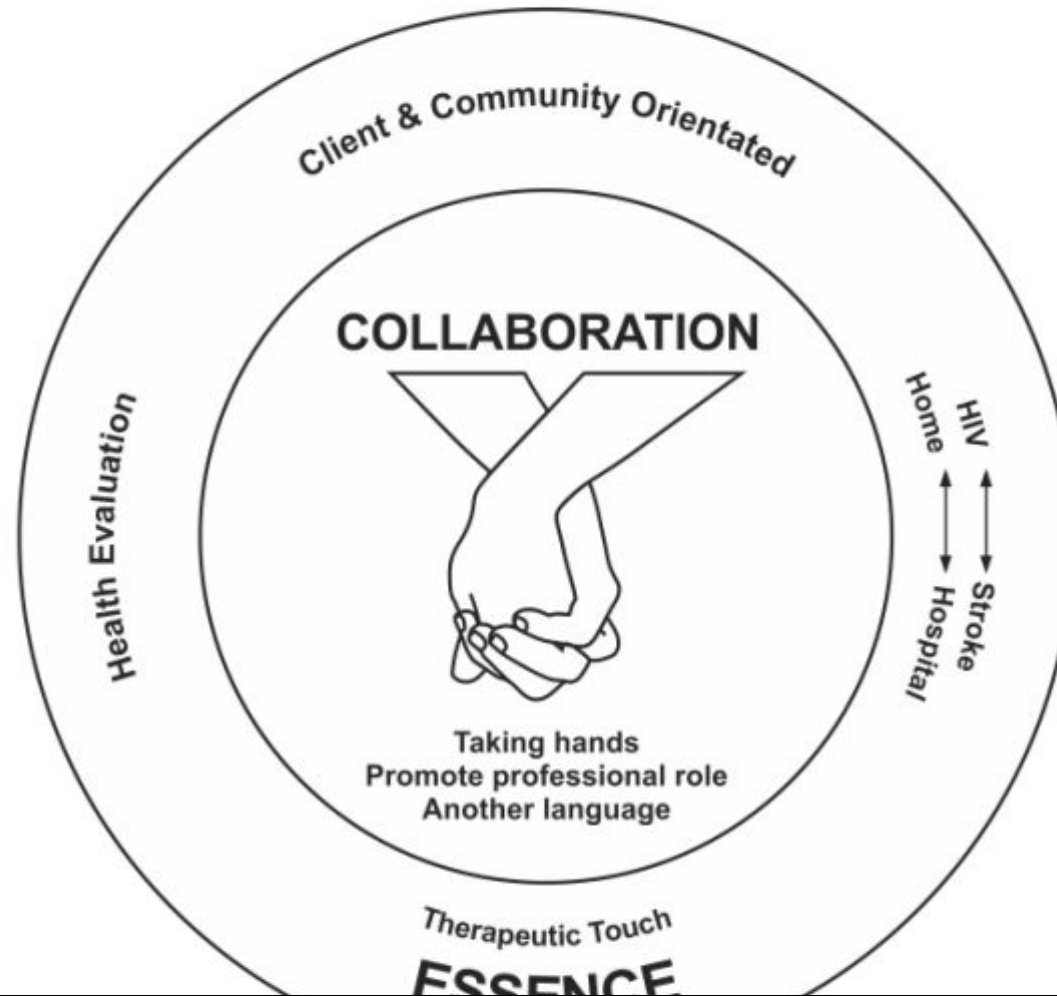
<https://www.surveymonkey.com/optout.aspx>

APPENDIX O. SURVEY TO VERIFY THE MODEL

Are you in general in agreement with this model? If not, kindly comment in the text box below (The model is followed by a short description). Kindly note that "health evaluation" in the circle should read "health EDUCATION/Promotion"

## POSITIVE PRACTICE ENVIRONMENT

Effective management Infrastructure Transport  
Mentoring Equitable distribution



Authentic care Improved skills  
Positive characteristics Resist isolation

## GATEWAY TO PERSONAL AND PROFESSIONAL GROWTH



## Community Physiotherapy

**\*1. The model has the following parts**

- (1) the essence of community physiotherapy;**
- (2) the collaborative nature of community physiotherapy;**
- (3) prerequisites for a positive practice environment (often absent in reality), and**
- (4) community physiotherapy as a gateway to personal growth and professional development.**

### **The essence of community physiotherapy**

**Compulsory community service in physiotherapy provides comprehensive care in a variety of settings, from homes, clinics and schools to hospitals. In addition a wide spectrum of conditions is treated, from HIV to pregnancy, and over the lifespan of clients. Community physiotherapists act as generalists, treating conditions that reflect the country's quadruple burden of disease. They perform common community physiotherapy services with a high priority on health education and health promotion.**

**Clients experience the services as beneficial. Therapeutic touch, for example, is particularly beneficial. Physiotherapists reported that services are orientated towards the needs of clients. In community-service physiotherapy, the holistic team addresses broader issues than physical health – including factors contributing to poverty.p/>**

### **The collaborative nature of community physiotherapy**

**Collaboration, the backbone of community physiotherapy, is impaired as a result of the lack of awareness about physiotherapy's role in patient care and public health. Amongst others, doctors and members of target communities are ignorant about**

**physiotherapy. The inability to understand or speak the language of the communities where the community service physiotherapists are placed also hinders collaboration.**

### **A positive practice environment (often absent)**

**Some factors need to be in place to facilitate a positive working experience in the community setting. These factors include effective management, sufficient infrastructure, equitable distribution of physiotherapists between different areas, and the availability of transport to both health professionals and clients.**

**As part of a positive working environment the community service physiotherapists voiced a need for discipline-specific supervision and mentoring. A mentoring programme would indeed be pivotal component in continuous learning<sup>27</sup> and for improved services.**

### **Community physiotherapy as a gateway to personal growth and professional development**

**Several factors contribute to the growing sense of being a professional physiotherapist. One factor is positive feedback from clients who see the physiotherapist as a helpful, significant team member. Getting familiar with clients' living conditions during home visits also facilitates appropriate, insightful authentic intervention, another hallmark of professionalism.**

**On the path to increased professionalism, personal characteristics, such as resilience, creativity and perseverance assist in overcoming difficult demands and conditions. Responsibilities are initially challenging, but skills improve gradually. During compulsory community service, improved functioning as a professional therapist is also reinforced through teamwork. Other team members are a resource, prevent professional isolation, and discussions improve clinical decision making.**

**However, not everyone enjoys the compulsory service year**

**If you want more detail, kindly request from:**

**[Email Me](#) (Wait for the e-mail to open)**

**Office tel: +27 (0)12 354 1353**

**Fax: +27 (0)12 354 1226**

**Cell: +27 (0)82 312 7159**

## **2. Select the university where you graduated**

- University of Cape Town
- University of the Free State
- University of Kwa-Zulu Natal
- University of Limpopo (Medunsa campus)
- University of Pretoria
- University of Stellenbsch
- University of the Western Cape
- University of University of the Witwatersrand (Wits)

### 3. Select the province where you did your compulsory community service year

- Eastern Cape
- Free State
- Gauteng
- Kwa-Zulu Natal
- Limpopo
- Mpumalanga
- Northern Cape
- Northe-West Province
- Western Cape

APPENDIX P. CODING CERTIFICATE

## **Qualitative data analysis**

**Karien Mostert-Wentzel**

PhD in Physiotherapy

THIS IS TO CERTIFY THAT

Twelve (12) Individual Interviews were co-coded

For the study:

### **Development of standards for undergraduate community physiotherapy education in South Africa**

We declare that consensus was reached on the major themes reflected by the data during a consensus discussion on the 5 September 2011.



Retha Visagie



Jeanette Maritz

APPENDIX Q. CLAUSE OF CONFIDENTIALITY

## CONFIDENTIALITY CLAUSE

BETWEEN

**EMOYENI RESEARCH COLLABORATIONS**

AND

**KARIEN MOSTERT-WENTZEL**

**Research Title: Development of standards for undergraduate community physiotherapy education in South Africa**

The research code of ethics mandate that confidentiality should be maintained throughout data collection, data analysis and report writing.

The co-coders of the qualitative data collected for this study hereby commit themselves to maintaining of confidentiality when co-coding the data.

I, **Retha G. Visagie** and **Jeanette E Maritz** commit to keep all information confidential during the course of analyzing the qualitative data for the above stated research study.

Co-coder:



1. Signature      Date: 2011-08-26



2. Signature      Date: 2011-08-26



APPENDIX R. CODING MATRIX

Phase Discovery/Initiate				
Processes Appreciative				
Questions				
	Q1: Reflecting on your work as a community physiotherapist last year, specifically when you worked outside of the hospital, what would be your most satisfying experience/highlight	Q2: What did you value most about the experience of working in communities	Q3: When working at its best, what makes community physiotherapy exciting and productive?	Q4: What would you say, are the unique factors that make community physiotherapy contribute nest to patient's wellbeing?
Participants				
P9 D20020	"It was a sick bay in Nelspruit, and I saw patients on an outpatient basis, so I didn't really do community service."	"working on my own"	"making a difference in the people's lives..."	"Bring physio to the people"  "people who couldn't go to physiotherapist because there wasn't anybody around, that means there was physio available."
P10 D20021		"...people are very appreciative of what you do... problem solve quite a lot, which is really lovely because you are basically getting back to basics."  "...use what you have..."  "You solving a hell of a lot more of their problems than what you do in hospital. Because you go to their homes, or you know you are working on a level with them where they need to function on a daily setting."	"...you just have to come up with your own...you have to come up with everything that you can to solve their problems."  "Each person has their own set of problems and their social background and everything contributes to what you are doing."	"The factors would be the environment. They are more at home and you are able to see them in a more relaxed environment and the, challenges that they are faced with you can solve more."

## APPENDIX S. CODES ORGANISED INTO CATEGORIES

### Code Families<sup>7</sup>

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HU: EagerBeagers  
File: [C:\AtlasMandjie\CommServesEagerBeavers\EagerBeagers.hpr6]  
Edited by: Super  
Date/Time: 2012-09-09 17:44:44

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#### Code Family: Essence

Created: 2012-09-09 17:30:36 (Super)

Codes (27): [Addressing a need] [Age group] [Ante-natal classes] [Appropriate treatment] [Assist with management] [CBOs] [Community need] [Conitnuity] [Contribution to the more vulnarable] [Customare care] [Diverse conditions] [Dsiability grants] [Exercise classes] [Health education] [Helping] [Management is time-consuming] [Needs orientated] [Outreach] [Planning] [Poverty] [Referrals DPOs] [Schedule] [Schools] [Self-reliability] [Settings] [Type of activity ADL] [Vulnerable populations]

Quotation(s): 77

---

#### Code Family: Gateway to professional development

Created: 2012-09-09 17:28:17 (Super)

Codes (20): [Build on pre-knowledge] [Challenges] [Confidence] [Enjoyable] [Enjoyable experience] [Feedback Pt] [Gain experience] [Getting to know the clients] [Growth] [Growth Responsibility] [Isolation] [Leadership] [Make a difference] [Not enjoyable] [Positive] [Positive personal] [Problemsolving] [Spirit] [Work as a generalist] [Working on my own]

Quotation(s): 38

---

#### Code Family: Prerequisites for a positive practice environment

Created: 2012-09-09 17:25:32 (Super)

Codes (17): [Apparatus] [Equipment] [Inequitable distribution PTs] [Lack of access] [Management is time-consuming] [Management Organisation] [Monitoring and Evaluation] [Opportunity to go on courses] [Planning] [Poor management] [Resources] [Supervision] [Support] [Too few physios] [Transport Patients] [Transport PTs] [Unmotivated staff]

Quotation(s): 45

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#### Code Family: Taking hands

Created: 2012-09-09 17:21:39 (Super)

Codes (5): [Communication channels] [Ignorance about PT role] [Ignorance about the role Doctors] [Role confusion other disciplines] [Team work]

Quotation(s): 34

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<sup>7</sup> A “code family” is what was called a “theme” in the text

APPENDIX T. MODEL DRAFT 1

# Physiotherapists' Experiences during Compulsory Community Service: A Qualitative Study u33

Van der Walt, M., Redivo, V., Bredenhann, M., Eloff, N., Essa F., and Mostert-Wentzel, K.

CONTACT- karien.mostert@up.ac.za

## INTRODUCTION

- ☛ The government has instated a mandatory community service year in the public sector for all newly qualified graduates since 2003.
- ☛ Currently there is very little research documented on the skills needed by community physiotherapists and the community's they work in.
- ☛ There is a shift from tertiary settings to community settings

u29  
u1

## AIMS

- ☛ To discover the experiences of physiotherapists in their community service year. u28
- ☛ To further improve current PT practice in community-based settings u2

## METHODOLOGY

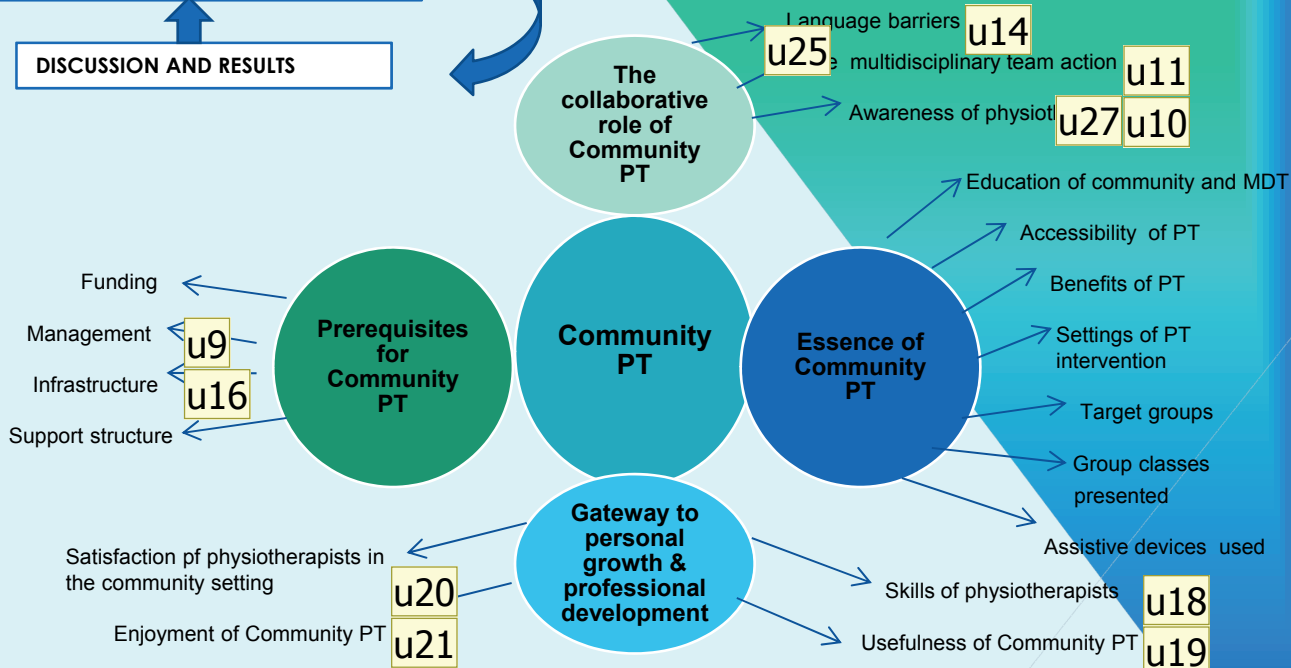
- This study was a qualitative contextual exploration within an appreciative enquiry framework.
- The study population was physiotherapists who had completed their compulsory community year.
- Purposive/ judgment sampling was used. Initially eleven information rich community physiotherapists were purposively selected. The first therapist was recruited via snowballing. This process continued until data saturation was reached and a sample of n=15) participants were obtained.
- The interview was conducted during a second telephone call. Data was recorded on a voice recorder and transcribed verbatim. A semi structured interview guide was constructed according to an Appreciative Inquiry (AI) framework
- Data was collected, transcribed, coded, grouped into categories and finally into 4 themes.

u3  
u2  
u4  
u5  
u6  
u13  
u7

## CONCLUSION

This exploration contributes to the clarification of the essence and collaborative nature of physiotherapy in public health, its prerequisites, and its contribution to the professional development and personal growth of newly qualified physiotherapists.

## DISCUSSION AND RESULTS



## REFERENCES

- \*MALEKA, D; STEWART, A & FRANZSEN, D 2008; Physiotherapy services required of primary health care level in Gauteng and Limpopo Provinces (service provider's perspectives physiotherapists/assistants), *South African Journal of Physiotherapy*, 11:2-7.
- \*MCPHERSON, K; HEADRICK, L & MOSS, F 2001; Working and learning together: good quality care depends on it, but how can we achieve it? *Quality in Health Care*, 10(2):44-53.
- \*PUNAR, MENDOZA, RAJ; ARIMAYON, NIC; NAWARLAZ, MD & WAKEFIELD, A 2008; The potential advantages and disadvantages of introducing interprofessional education in to the healthcare curricula in Spain, *Nurse Education Today*, 28:327-336.
- \*REID, SJ 2001; Compulsory community service for doctors in South Africa- an evaluation of the first year, *South African Medical Journal*, 91(4):327-337.
- \*ROBERTS, P & SMITH, S 2009; An investigation of the occupational therapy and physiotherapy roles in a community setting, *International Journal of Therapy and Rehabilitation*, 21(1):21-28.

APPENDIX U. MODEL DRAFT 2

# Physiotherapists' Experiences during Compulsory Community Service: A Qualitative Study

van der Walt M, Redivo V, Bredenhann M, Eloff N, Essa F, and Mostert-Wentzel, K.

CONTACT: karien.mostert@up.ac.za

## INTRODUCTION

☞ The government instated a mandatory community service year in the public sector for all newly qualified physiotherapy (PT) graduates in 2003.  
☞ It has not been investigated whether the training for work in community-based settings fit the skills and knowledge needed in reality.

## CONCLUSION

This exploration contributes to the clarification of the essence and collaborative nature of physiotherapy in public health, its prerequisites, and its contribution to the professional development and personal growth of newly qualified physiotherapists. The findings form the basis for the revision of core competencies in the undergraduate curriculum.

## AIM

To explore the experiences of physiotherapists in their compulsory community service year.

## METHODOLOGY

- This study was a qualitative contextual exploration.
- The study population was physiotherapists who had completed their compulsory community year.
- Initially eleven information-rich community physiotherapists were purposively selected. The other four were referrals from the initial interviewees (snowball sampling). The final sample comprised 15 participants.
- Data were collected during a recorded telephonic interview, and transcribed verbatim. A semi-structured interview guide was used, constructed according to the Appreciative Inquiry framework.
- The text was coded, grouped into categories, and finally into four themes, according to the data analysis process described by Tesch.

## RESULTS

- Collaboration is impaired due to the **lack of awareness about the contribution that Physiotherapy can make** to patient care and public health, by the stakeholders mentioned earlier, especially medical doctors and members of target communities.
- **Language** is a common **barrier** that are addressed by 1) the employment of interpreters and 2) PTs learning the local language.

- Community physiotherapy happens **in collaboration** with clients, the multidisciplinary health team including home-based carers, local authorities, and other key stakeholders, such as Disabled People Organisations (DPOs).
- The holistic team addresses broader issues than physical health, specifically **poverty**.

- Dedicated **budget**
- Effective **management**, e.g. orientation
- **Basic infrastructure** for individual treatments: a room with space for a plinth and exercise balls.
- **Accessibility** of services: transport for patients and/or appropriate transport for physiotherapists.
- Discipline specific **supervision** and **mentoring**.
- **Equitable distribution** of therapists.

Prerequisites

Collaborative nature

Community Physiotherapy

Essence

Gateway to professional development

- Principle: Based on needs and assets of clients and communities. These are identified through formal client surveys, assessments and **listening** to clients.
- Comprehensive health care with focus on **health education** (HIV, hypertension, stroke, motor impairment (CP), diabetes, back care, pregnancy and family planning), as well as **counselling**.
- A unique trait of individual treatment is "**therapeutic touching**".
- Activities: A variety such as distribution of assistive devices, **group intervention**, e.g. exercise classes, and managing physiotherapy clinic-based and outreach services.

- **Positive feedback** from clients strengthens the identity of being a helpful, significant team member.
- Not everyone enjoyed the experience.
- **Personal characteristics** such as resilience, innovation, creativity and perseverance, assist in overcoming difficult demands and conditions.

- Responsibilities are initially challenging, but **skills improve gradually**.
- Familiarity with **clients' living conditions** facilitates appropriate, insightful intervention.
- **Teamwork** reinforces that other members are a resource, not only in delivering a better service, but also in **preventing professional isolation**

- **Settings:** Clinics, schools, care centres, etc, and specifically **homes of clients**.
- **Main target groups:** the poverty-stricken, children with motor impairment, adolescents, the elderly, patients with tuberculosis and **Aids**, pregnant women, spinal and orthopaedic patients and people who had sustained a stroke.

## APPENDIX V. CODES FOR THE DEFINITION OF COMMUNITY PHYSIOTHERAPY

Code	Definition of the code
1	Agreed within the definition of community physiotherapy
2	Found the definition comprehensive or excellent
3	Conditionally agree
4	Agreed, but improved the language
5	Extended on elements that were already in the definition
6	Suggested new elements that were added
7	Formulated elements in the definition differently
8	Identified an inappropriate gap in the definition, e.g. hospital work
9	Specific skills needed in terms of conditions and target groups
10	Sceptical. Agreed in theory
11	Limitation to implementation
12	Overlap with 6
13	Totally disagreed
14	Essential part of training (later integrated with 2)
15	Disagreed with an element of the given definition



APPENDIX W. E-MAIL INVITATION TO PARTICIPATE IN DELPHI ROUND 1

**To:** [Email]

**From:** "karien.mostert@up.ac.za via surveymonkey.com" <member@surveymonkey.com>

**Subject:** Innovation in Rehabilitation Education

**Body:** We are conducting a survey, and your response would be appreciated.

Here is a link to the survey:

<https://www.surveymonkey.com/s.aspx>

This link is uniquely tied to this survey and your email address. Please do not forward this message.

Thanks for your participation!

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.

<https://www.surveymonkey.com/optout.aspx>

APPENDIX X. INVITATION TO DELPHI ROUND 2

**To:** [Email]  
**From:** "karien.mostert@up.ac.za via surveymonkey.com" <member@surveymonkey.com>  
**Subject:** Innovation in Community and Public Health Physiotherapy  
**Body:** Dear [FirstName]

Thanks you for your willingness to participate. Your opinion on the knowledge, skills and attitudes that physiotherapists should have to practice in community-based and public health settings is valued.

Information will be used to revise the undergraduate curriculum. Findings are shared with the eight universities who offers physiotherapy education in South Africa.

Due to the nature of the survey it could take around 30 minutes to complete :-)

Here is a link to the survey:  
<https://www.surveymonkey.com/s.aspx>

Would you kindly to try to submit by middle December?

Please do not hesitate to contact me if there are any hick-ups with the survey.  
Cell: +27 (0)82 312 7159 (I'll phone you back.)

Thanks for your participation!

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.

<https://www.surveymonkey.com/optout.aspx>

## APPENDIX Y: CONCEPTUALISATION OF THE CURRICULUM

Already in 1984 Harden, Sowden, and Dunn (1984) argued that curriculum planners need to move past the focus on innovation in teaching strategies, i.e. problem-based learning, and assessment strategies, such as OSCES, *per se* to a broader conceptualisation of the curriculum. They described a model with continua along five dimensions: 'student to teacher-centred'; 'problem-based to information gathering'; 'integrated to discipline-based'; 'community-based to hospital-based'; 'electives to standard programme'; and 'systematic to opportunistic' (Harden, Sowden, and Dunn 1984 in Bligh, Prideaux and Parsell 2001: 520). The first letters of the terms that indicate the more innovative side of the continuums form the word 'SPICES', which is the name by which the model is known. The SPICES model was intended for overall curriculum planning and evaluation (Tekian 1997; Prideaux 2003); however, authors such as van den Berg (2004) evaluated individual teaching sessions to determine the overall inclination on the SPICES dimensions.

The methods suggested by the panel in this phase of the Delphi were therefore similarly evaluated. Unlike van den Berg (n.d.), who evaluated a real curriculum, the table on the next page deals with a potential curriculum. The higher the score the closer the method is to the limit of the dimension listed in the first row of the table. The ratings are obviously the subjective rating of the researcher. The value of this artificial exercise is that it illustrates that some criteria are inherent to the method and others depend on how the learning and teaching, or assessment opportunity, is designed and structured. For example, the nature of the lecture makes this method more teacher- than student-orientated. In contrast, the rating for an essay depends on how much choice the student is given in selecting the theme of the essay and how the assignment is structured.

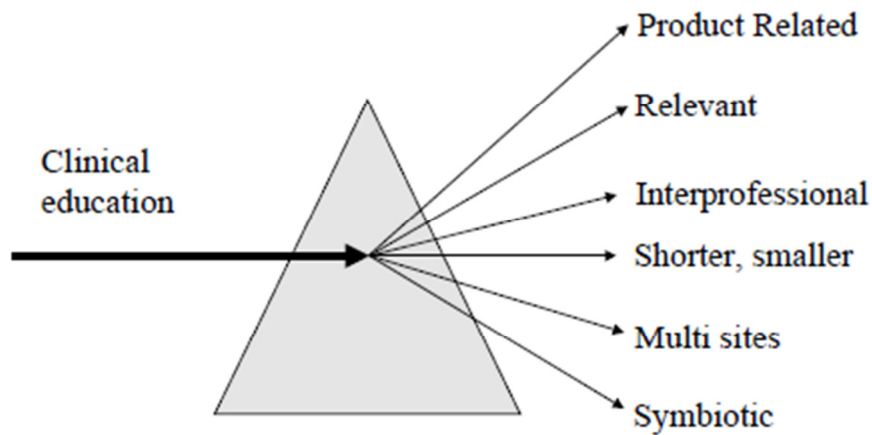
The pattern that emerges is that whether the method is student-centred and problem-based tends to be characteristic of the specific method. However, the other criteria depend on how the method is designed and implemented.

**Ratings of methods (suggested by the Delphi panel) along the SPICES dimensions**

	Student-centred	Problem-based	Integrated	Community Based <sup>b</sup>	Electives	Systematic
<b>Teaching methods</b>						
Case-based problems and workshops	4	5	P	P	Potentially 5	Potentially 5
Journal club	4	5	P <sup>c</sup> 5	P5		
Lecture	1	2	P5	1		
One-on-one teaching*	4	4	4	P5		
Role-play*	3	4	P5			
Peer-feedback	4	4	P5			
Reflection	5	5				
Role-modelling	1 <sup>a</sup>					
Service-learning	3	5	5	5		
<b>Assessment</b>						
Written tests <sup>a</sup> , SAQ, MCQ	1	P	P	1		
Essays	4 (P5)	P5	P5	P4		
Oral exam	1	P5	P5	P4		
Direct observation/ITER	1	P5	P5	P4		
OSCE <sup>c</sup> /SP	1	P5	P5	P4		
MSF	4	P5	P5	P4		
Portfolio	5	5	P5	P4		
Simulations	1	5	P5	P4		
Logbooks	4	P5	P5	P5		
Recordings (audio and video)	P4	P4	P5	54		
Presentations	P5	P5	P5	P5		
Peer +other evaluation	5	P5	P5	P5		

<sup>a</sup> When combined with reflection; <sup>b</sup> Community-orientated = 4; <sup>c</sup> Potentially

Another useful framework for curriculum development is that PRISMS model (Oliver et al. 2008; Prideaux 2009) illustrated in the figure on the next page.



**The symbiotic curriculum (PRISMS) (Source: Bligh, Prideaux and Parsell 2001)**

The key features of this model are explained in the text box on the next page. Service-learning as a teaching and learning strategy, combined with authentic assessment during the placement, can potentially contribute to all the elements of the PRISMS model. The symbiotic curriculum needs to be based on four fundamental relationships: (1) A personal – professional relationship; (2) A clinician – patient relationship; (3) A university – health service relationship; and (4) A government – community relationship (Prideaux, Worley and Bligh 2007; Barrow, McKimm and Samarasekera 2011).

### Key features of the PRISMS model

**Product focused** – i.e. practice based linked with professional development. Students learn about basic science by applying it in the clinical context

**Relevant to students and communities**, reflecting the needs of local health communities as well as student learning needs

**Inter-professional** – programmes will espouse, encourage and reflect a culture of multi-professional learning, collaboration and teamwork

**Shorter courses taught with smaller numbers of students on each 'unit'** (placement, learning set, group). This also reflects the worldwide shift towards graduate entry programmes and the need to better integrate undergraduate education with postgraduate training

**Multisite locations** – shift from large teaching hospitals with restricted patient mix to primary care and smaller hospitals and units. This incorporates the shift to a more immersed learning experience, especially in community settings, so that students can establish the closer relationships with patients and health colleagues essential for contemporary medical practice

**Symbiotic (organic whole)** – this is the link with the prism where clinical education is the driving force, partnerships among communities, medical schools, learners and teachers are important and medical education becomes part of an increasingly diffuse and dynamic health system where healthcare is only one part of the wider public service agenda

Source: Bligh, Prideaux and Parsell (2001) in McKimm (2010: 46)