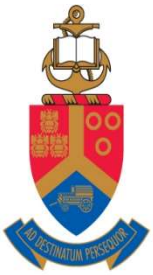

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DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

by

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A thesis by publication submitted in fulfilment of the requirements for the degree

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PRETORIA

SOUTH AFRICA

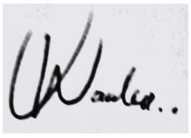
24 January 2024

DECLARATION

I Vertharani Nolene Naicker hereby declare that the work contained in this thesis titled: `*Development of a Staffing Norm Framework for Dietitians at South African Central and Tertiary Public Hospitals*` is my original work.

Where there were contributions from someone else's work, this was duly acknowledged. Relevant ethics approval was obtained through the University of Pretoria`s research and ethics committee as applicable and in accordance with the University of Pretoria's Code of ethics for researchers.

This thesis is being submitted for the degree of Doctor of Philosophy in Dietetics, University of Pretoria, Pretoria, South Africa. This work has not been submitted before or for any other degree or examination at this or any other tertiary institution.

Signature: 

Date: 10 January 2024

DEDICATION

This work is a dedication to:

My dearest dad, *Mr Lallie Naicker* and my loving mum *Mrs Selvie Naicker.*

There is nothing in this world that I cannot achieve through the eyes of my parents!

Dad, this journey started with you right by my side but mid-journey you left to become my guardian angel instead. You are now smiling down upon me from up above, your presence and blessings were felt throughout this PhD journey in ways that nobody will believe. Through it all, I persevered with only your words of encouragement, that kept me going. Thank you for working so hard to get me to this stage today, and for always believing me.

My loving mum, I thank you for your tremendous love all my life! Thank you for being both a mum and dad to me in the last 2 years. Through your constant showering of love and care, you really tried your level best to fill that enormous gap in our lives. I promise that I will continue to strive to make you both proud. My accomplishments are only through the guidance and blessings of my wonderful parents.

This is also a dedication to my loving husband Rivashlin, thank you for sharing in all my disappointments and victories. Thank you for your love, patience, understanding, support, and constant encouragement along the way!

To my adorable and incredible children Sayan (10) and Talya (7), thank you for your understanding as little as you are. Thank you for sacrificing many evenings, weekends, holidays, and special occasions without mummy, giving me the opportunity to work. I couldn't have done it without you my beautiful family. I promise to make it up to you.

Finally, a big thanks to my brother Jody, my sister Cindy, and my sister-in-law Tersha for lending an ear when I just needed to get a load of my chest. Thank you for comforting me and encouraging me to continue when I needed it the most.

To the Naicker Family……. You mean the world to me!

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A final thanks to all friends and colleagues who played a part in my journey. Every small contribution or word of encouragement made a huge difference!

SUMMARY

DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

Human resources form the backbone of South Africa`s healthcare system and is critical to the successful implementation of healthcare services. Dietitians are regarded as key role players of the health care team in the essential delivery of nutrition services in hospitals. As registered health care professionals this cadre is responsible for the provision of community nutrition, therapeutic nutrition, and food services, guided by their scope of profession. Hence the need for evidence-based workforce tools to determine the adequacy of these numbers in meeting the nutritional needs of the population. In the absence of such tools for dietitians, this study focussed on the development of a staffing norm framework for the South African central and tertiary public hospital setting.

The World Health Organisation (WHO) Workload Indicators of Staffing Need (WISN) has been applied and proven beneficial in several disciplines across various health care settings and especially in the African region. Hence, this WISN based developmental study was conducted through the three phases of preparation, consensus, and finalisation. The preparation phase of the study was significant in mapping the distribution of dietitians and forming an initial baseline. Whilst the job descriptions analyses provided information on the current work practices of the cadre.

Thereafter, a consensus exercise was required to determine if these initial work practices would gain agreement among hospital dietitians. Hence, an online Delphi survey included twenty-one head dietitians at central and tertiary public hospitals to form a cadre based expert group. A ninety-two percent agreement rating resulted in a standard set of work activities for dietitians at central and tertiary public hospitals. The outcomes of this consensus exercise progressed the study towards the finalisation phase.

Finalisation entailed the complete application of the WISN methodology in determining the WISN based staffing requirement of dietitians and, the development of the WISN based South African staffing norm framework for central and tertiary public hospitals. Findings indicated that central and tertiary public hospitals did not meet the WISN required numbers of dietitians. All twenty-one hospitals did not have sufficient staff to meet their service needs with dietitians experiencing extreme work pressures especially in the absence of a support cadre. The lack of managerial and support staff increased the daily tasks of current dietitians leading to the need for overtime.

As workforce assessments require periodic reviews to allow for the appropriate planning and forecasting of dietitians, context specific tools are a must. Hence, the second part of the finalisation phase utilised the WISN methodology for the development of a staffing norm framework. In addition, the automation of the generic WISN tool inspired the need for a similar context specific WISN based tool for dietitians. As a result, an excel tool was constructed to allow for easier implementation and user-friendliness of the staffing norm framework. The implementation tool was validated against the WHO WISN tool and found to be adequate for use in the South African context.

The findings of this study provide the necessary results to motivate and prioritise the staffing needs of dietitians at South African central and tertiary public hospitals. The developed tool which is context and cadre specific can be used by policy makers and managers at a national and provincial level to inform the staffing needs of dietitians at central and tertiary hospitals. The tool can also be adapted for use at regional, district and specialised hospitals to determine the staffing needs of dietitians at these levels of care.

Keywords: Delphi, Dietitian, Framework, Human resources, Hospital, South Africa, Staffing, Staffing Needs, Tools, WISN

ABSTRACT

DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

Background: The global human resources for health strategy indicates the necessity to prioritise human resources to improve health care and overall health outcomes. South Africa`s (SA) double burden of malnutrition, the core of the quadruple burden of diseases stresses the need for nutrition action. The absence of a national workforce planning tool to address nutrition workforce challenges impacts on the implementation of nutrition interventions and the aligned outcomes. The registered dietetic professional plays a significant role in the provision of appropriate and quality nutrition services. Hence, the need for an investment in an evidence-based workforce planning tool to determine the staffing needs of the cadre.

Aims and Objectives: This study aimed to develop a staffing norm framework to determine the needs of dietitians at South African central and tertiary public hospitals using the Workload Indicators of Staffing Need (WISN).

Design and Methods*:* A three phased developmental study based on the World Health Organisation Workload indicators for staffing (WISN) was conducted. In Phase 1 (preparatory phase) the distribution of permanently employed dietitians at South African public hospitals was mapped. The job descriptions of dietitians at central and tertiary public hospitals were analysed to inform a baseline of current dietetic practices for phase two of the study. In phase 2 (consensus phase) an online Delphi exercise was conducted to determine a standardised list of workload components and activity standards as per the WISN methodology. In phase 3 (finalisation phase) the eight step WISN methodology was applied to: 1) To conduct a case study at 21 central and tertiary public hospitals to determine the staffing needs of dietitians. 2) To develop a staffing norm framework and implementation tool for dietitians at the same level of care.

Results: Findings from the preparatory phase indicated a total of 844 permanently employed dietitians and 189 available dietetic vacancies at SA`s public hospitals. This first phase also provided a baseline of the work activities of dietitians for the Delphi consensus phase. The online Delphi resulted in a 92% agreement rating on all proposed and newly added workload components. A total of 45 workload components together with aligned activity standards was finalised. The application of WISN in the finalisation phase indicated extreme understaffing with high work pressures at the 21 hospitals. The lack of support staff and managerial posts

compounded staffing needs often resulting in unnecessary overtime. WHO recommends the use of WISN as part of periodic reviews to allow for long-term forecasting of staffing needs. Hence, this last phase developed a context and cadre specific staffing norm framework. In addition, a South African WISN based excel tool was also developed to support implementation of the framework, allowing for automation and user-friendliness. The validation of the tool against the WHO WISN supported its use in the South African central and tertiary hospital setting.

Conclusion and Recommendations: WISN appears to be a beneficial tool in determining the needs of the cadre. The versatility of WISN has resulted in the development of a context specific tool to assist policy makers in prioritising the needs, future planning and forecasting of dietitians at South African central and tertiary public hospitals. It is recommended that similar tools be researched to prioritise the needs of dietitians at regional, district and specialised hospitals.

Keywords: Delphi, Dietitian, Framework, Human resources, Hospital, South Africa, Staffing, Staffing Needs, Tools, WISN

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LIST OF DEFINITIONS

Activity Standards (AS)	Activity standard refers to time necessary for a well-trained, skilled and motivated worker to perform an activity to professional standards in the local circumstances.
Available Working Time (AWT)	The time a health worker has available in one year to do his or her work, taking into account authorized and unauthorized absences.
Additional activity	Activities performed only by certain (not all) members of the staff category and for which annual statistics are not regularly collected.
Central Hospital	Hospitals that have a maximum of 1200 beds. Provides tertiary services, central referral services and may also provide national referral services. Also provides training of health care providers, conducts research and is attached to a medical school.
Delphi Method	The Delphi method is a process mostly used in research and economics, that aims to collect opinions on a particular research question or specific topic, to gain consensus. The opinions are collected from a group of experts that are not physically assembled, normally through questionnaires.
Health service activity	Activities performed by all members of the staff category and for which annual statistics are regularly collected.
Standard Workload	A standard workload is the amount of work within a health service workload component that one health worker can do in a year.
Support activity	Important activities that support health service activities, performed by all members of the staff category but for which annual statistics are not regularly collected.
Tertiary Hospital	Has between 400 to 800 beds, provides specialist, sub-specialist, and intensive care services. May provide training for health care workers and receives referrals from regional hospitals.
Workload Indicators for Staff (WISN) Ratio	Refers to the current number of staff divided by the actual number of staff.
Workload component (WC)	One of the main work activities that take up most of a health worker's daily working time.

LIST OF ACRONYMNS/ABBREVIATIONS

ABCDE	Assessment, Biochemical, Clinical, Dietary and Evaluation
AS	Activity Standard
ASD	Assistant Director
BCEA	Basic Conditions of Employment Act
BDA	British Dietetic Association
BMI	Body Mass Index
AWT	Available Working Time
CAF	Category Allowance Factor
CAS	Category Allowance Standards
CD	Chief Dietitians
CHC	Community Health Centre
CPD	Continuous Performance Development
DD	Deputy Director
DPSA	Department of Public Service and Administration
DOH	Department of Health
EC	Eastern Cape
EN	Enteral Nutrition
FSM	Foodservice Manager
FU	Follow-Up
GP	Gauteng
HR	Human Resource
HRH	Human Resources for Health
HPCSA	Health Professions Council of South Africa
IAF	Individual Allowance Factor
IAS	Individual Allowance Standards
IEC	Information, Education and Communication
ICU	Intensive Care Unit
INP	Integrated Nutrition Programme
JD	Job Description
LP	Limpopo
MBFI	Mother-Baby Friendly Initiative

MUAC	Mid-Upper Arm Circumference
NC	Northern Cape
NDOH	National Department of Health
NDP	National Development Plan
NHI	National Health Insurance
NHRD	National Health Research Database
OSD	Occupation Specific Dispensation
QIP	Quality Improvement Plan
SANC	South African Nursing Council
SAPC	South African Pharmacy Council
QGIS	Quantum Geographic Information System
SA	South Africa
SDG	Sustainable Development Goal
SPSS	Statistical Package of Social Sciences
TPN	Total Parenteral Nutrition
UHC	Universal Health Coverage
WC	Workload Component
WHO	World Health Organisation
WISN	Workload Indicators of Staffing

CHAPTER ONE: INTRODUCTION

1.1 Background and rationale of the study

`Health systems can only function with health workers; improving health service coverage and realizing the right to the enjoyment of the highest attainable standard of health is dependent on their *availability, accessibility, acceptability and quality'*.[1] The South African Human Resources for Health (HRH) strategy for the health sector 2012-2017 referenced the need for the prioritisation of health professionals to be able to meet the vision `to improve access to health care for all and health outcomes'.[2] At the time SA experienced staff shortages, ine[1]quities and maldistribution of HRH with a lack of retention in the public sector.[2] The country was said to have a lesser number of health professionals per 10 000 population when compared to other developing countries.[2] One of the key findings of the SA Lancet commission in 2019 stated that `The HRH crises will undermine the achievement of high-quality Universal Health Coverage (UHC)` and thus recommended an investment and transformation of human resources in support of a high-quality health care system.[3] Hence, the current HRH strategy (2020-2030) stresses the need for an investment in the health workforce in order to see improvements in health outcomes.[4] South Africa has a higher health worker density than other African countries having met the Sustainable Development Goal (SDG) threshold of 44.5 doctors, nurses, and midwives per 10 000 population. However, the availability of health workers can only make a difference if they are accessible through equitable distribution, having the necessary competencies and motivation to deliver quality services based on the sociocultural needs of the given population.[1] The current concerns around the lack of national capacity, skills and appropriate and credible planning models, places an emphasis on the need for more sophisticated health workforce planning.[4] It is reported that there are still major concerns related to the maldistribution of health workers and variations in skill mixes between provinces.[4]

Sustainable Development Goal (SDG) 3 aims to ensure `good health and wellbeing`.[5] Nationally the Constitution of SA, through the *Bill of Rights and the aligned* SA National Development plan (NDP) 2030 makes reference to the achievement of UHC through the introduction of the National Health Insurance (NHI) Bill.[6-8] The NHI is intended to bring about reform and improve service provision by promoting equity and efficiency to the access of affordable, quality healthcare services for all South African`s regardless of their socio-economic status".[8] This requires attention and re-engineering of both the Primary Health Care (PHC) and hospital systems through implementation of the Ideal clinic and Ideal hospital

realisation frameworks intended to meet national standards in preparation for NHI.[2, 8, 9] In addition, Goal 9 of the SA NDP states `Fill posts with skilled, committed and competent individuals.`[7] The public health sector in line with strategic goals has focussed on the re-engineering and prioritisation of the PHC sector and the need to improve services at the primary level first to set a good foundation for preventative services.[2] Thus, the Ideal clinic realisation and maintenance framework and the implementation of district health specialist teams and ward-based outreach teams was established.[10, 11] Additionally, a guide for HRH in the PHC setting, `*an implementation guideline of health workforce normative guides and standards for fixed healthcare facilities 2015-2019*` was developed based on the World Health Organisation (WHO) Workload Indicators of Staffing Need (WISN).[12, 13] Presently, there is no such staffing guidance document for the hospital setting. However, the National Department of health (NDOH) strategized towards the determination and implementation of health workforce staffing norms for health facilities using the World Health Organisation (WHO) Workload Indicators of Staffing Need (WISN) method.[13, 14] The NDOH was unable to finalise norms for district and specialised hospitals due to the unavailability of data on district hospital service activities at the time.[13] This is said to be attributed to the fragmentation of information systems hindering health workforce planning.[13] Thus, there is currently no consensus on a suitable planning model for HRH in the public hospital sector.[4] Although, the use of WISN has raised questions regarding staffing estimates and affordability, the information obtained was found to be useful.[4, 14] As a result, the 2030 HRH strategy has not dismissed the use of the tool and aims to re-evaluate its use in national HRH planning going forward.[4]

1.2 The core research problem and its significance

Globally there is a tendency to focus on traditional health worker categories such as doctors and nurses, overlooking many other cadres that form a vital part of the health care team.[14] Although, the current SA HRH strategy accommodates for several other health workers, it must be noted that this list has not been exhausted.[4] Nutrition professionals (dietitians and nutritionists) registered under the auspices of the Health Professions Council of SA (HPCSA) have not been included in this list.[4] It is alarming to note that literature indicates that the probability of SA reaching the agreed upon nutrition-related targets are less than 1%.[3] The 2025 global nutrition targets are currently off track, and the current rate of progress will not allow for these targets to be met in time. SA`s double burden of malnutrition (over and under) has placed a severe strain on the health system and necessitates the need for dietitians.[14-17] Nutrition is ‘considered as one of the key determinants of health, wellbeing and human development.[3] Dietitians are currently the only registered nutrition professionals that provide

therapeutic nutrition services in the country.[18] Therefore, as guided by the regulations defining the scope of professions of dietetics, this project aimed to focus on dietitians.[19]

1.3 Problem statement

Hospital managers are required to both effectively and efficiently manage human resources in health facilities to ensure an even-handed distribution of workloads allowing for better productivity. Proper HRH planning can assist in determining the optimal balance in both functional and geographic distribution of health workers to address staff shortages.[18] In SA, dietitians are recognised, qualified and registered health professionals responsible for the provision of nutrition services as defined by the Health professions Act 56 of 1974.[19] Dietitians provide services related to community nutrition, food service administration and therapeutic nutrition.[19] All such areas may be required in varying degrees at hospital level. It is well known that staff shortages can lead to a deterioration of services offered to patients.[19,20] A non-optimal skill mix with a lack of support staff as well as a shortage of technical and administrative staff can lead to a high workload for dietitians in the public sector thus affecting the provision of quality nutrition services.[21] According to the Ideal hospital realisation and maintenance framework, 2018 an `*inadequate human resource distribution and allocation*` is a health system challenge that leads to a direct impact on the hospital environment and more importantly on overall health outcomes.[22] A strong element of success in implementing current nutrition policies, standards and ultimately expert nutrition practice in hospitals is dependent upon the availability, accessibility and the right quantity of dietitians for the provision of quality nutrition services.[1,23]

SA`s quadruple burden of diseases impacts on the health care system and places a similar demand on the need for nutrition services.[2, 23] Nutrition services form the cornerstone of both preventative and curative services and therefore the need to prioritise the dietetic cadre. Workforce assessments usually begin with an estimation of the numbers of staff in the cadre.[24] The demands for nutrition services as well as the unavailability of published data on the actual number of dietitians employed in the public sector since 2010 poses challenges with regards to the planning for dietetic services at hospital level.[2] SA data for 27 key professionals was outlined in the SA strategy for HRH in 2012 indicating ratios per 10 000 population, of which nutrition professionals (nutritionists and dietitians) showed a percentage of 0.16 (763) dietitians and nutritionists employed in the public sector in 2010.[2] There was no indication of the actual number of dietitians that formed part of this ratio.[2] The revised SA 2030 HRH strategy: Investing in the Health Workforce for Universal Health Coverage (UHC) is a 10-year strategy and aims to focus on 22 key professionals.[4] However, dietitians have not been

prioritised as one of the 22 key cadres and there is also no inclusion of any data on the cadre.[4] A study conducted in the Western Cape Province in 2018 seems to provide the most recent data. The study indicated that over half of dietitians (58%) were based at hospital level focussing on therapeutic nutrition while 42% of were based at PHC level of care.[23] However this data is only representative of one province in the country. Given the absence of a national workforce planning tool and guidance on dietetic staffing needs in the public hospital sector, this study focused on the development of a staffing norm framework for dietitians. Due to the various levels of hospitals and the differences in services between the levels as classified in the regulations related to categories of hospitals,[25] this project only focussed on central and tertiary level public hospitals.

1.4 The study aims and objectives

The aim of this study was to develop a Staffing Norm Framework for Dietitians at South African Central and Tertiary Public Hospitals.

The study was done in three phases each with specific objective(s). Figure 1 provides an illustrative view of the three phased framework development process with aligned objectives for each of the phases.

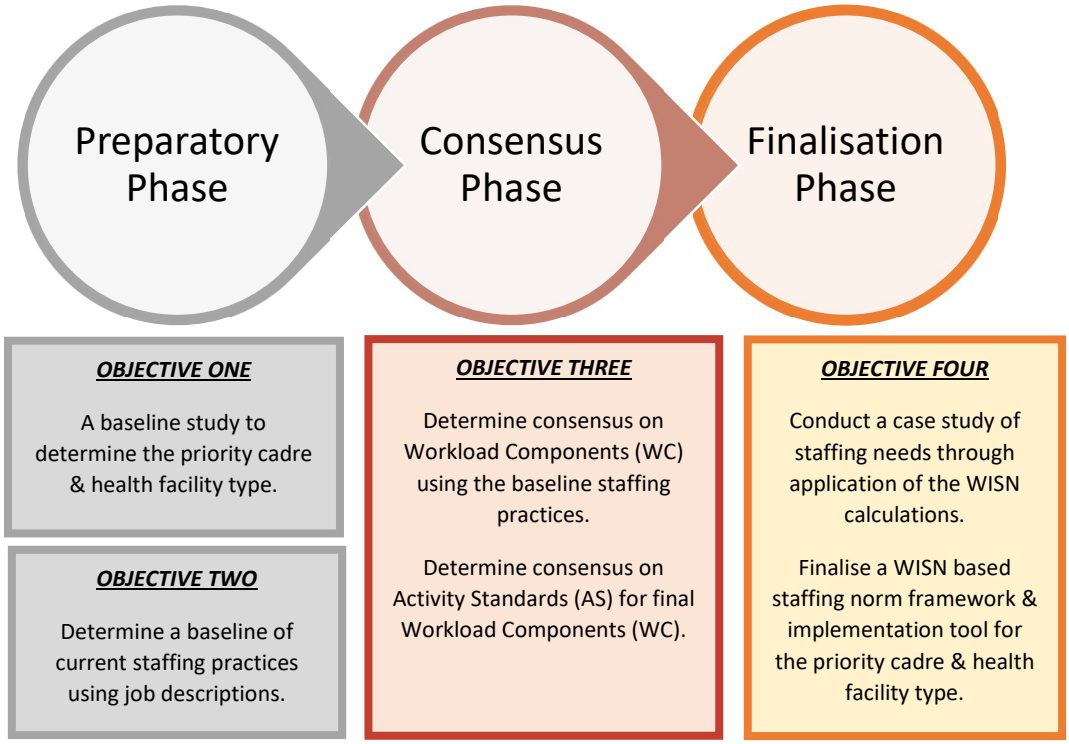

Figure 1.The Framework Development Process

1.5 An overview of the study methodology

This section only provides a brief overview of the study methodology. A comprehensive account of the methodology is presented in the subsequent chapters as manuscripts (chapters 3, 4, 5).

1.5.1 The study design

This study followed a three-phased developmental design using an online iterative consensus exercise.

1.5.2 A conceptual framework of the study based on the WHO WISN methodology

Figure 2 provides a conceptual framework of the developmental phases together with the aligned study objectives based on an application of the WHO WISN methodology.[12]

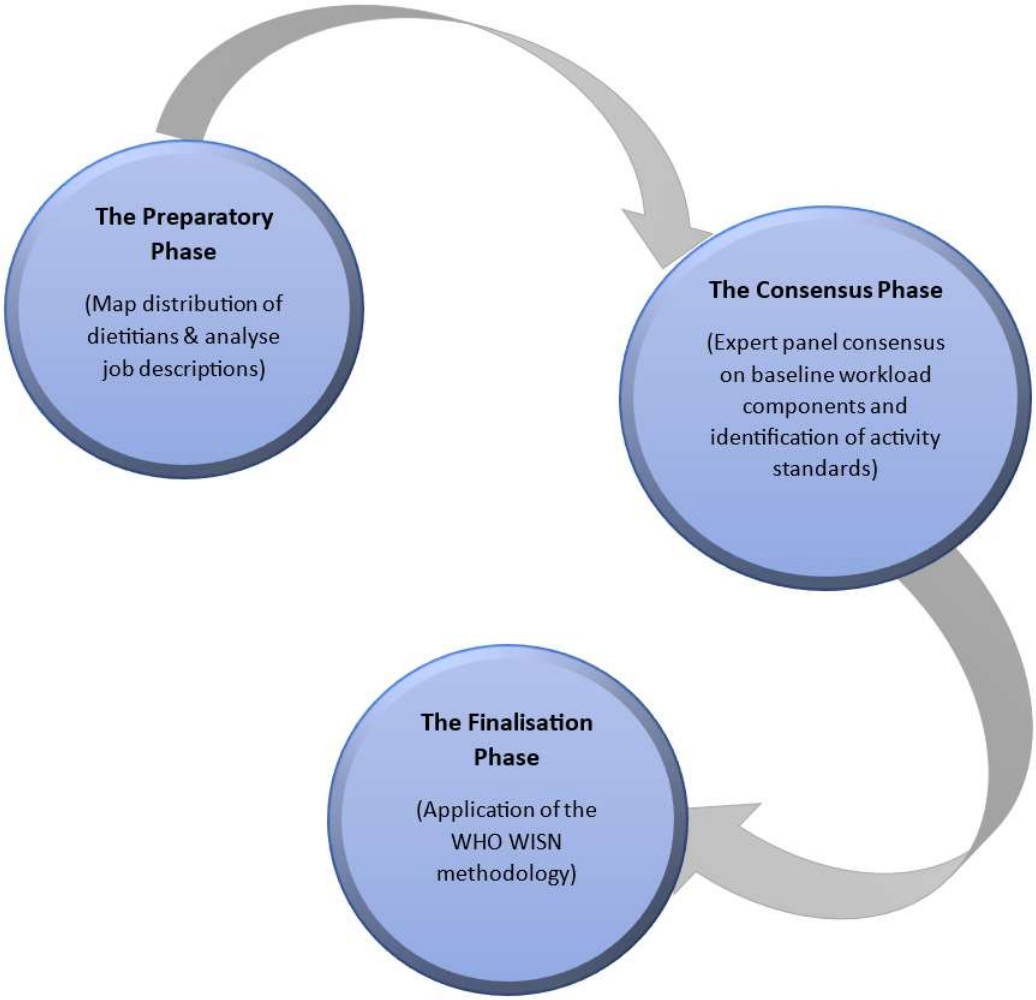

Figure 2: A Conceptual Framework of the Study based on the WHO WISN Methodology

1.5.3 Study setting and population, sampling design and sample size

Non-probability purposive sampling method was used to obtain a representative sample for each of the three phases of the study. The purposive samples consisted of nine provincial nutrition managers (preparatory phase) and 21 head dietitians (consensus and finalisation phases) representing 21 of 22 central and tertiary public hospitals in SA. One Tertiary hospital was excluded from the study as approval for data collection was not obtained in time.

1.5.4 Inclusion criteria

The study included provincial nutrition managers and head dietitians at central and tertiary public hospitals in SA. Inclusion criteria also allowed for a nominated representative should the provincial nutrition manager or head dietitian not be able to participate in the study or find the need for a more suitable candidate in relation to the topic of the study. Head dietitians at regional hospital level were only included for the purposes of conducting a pilot study. [19, 25-26]

1.5.5 Exclusion criteria

- All other health professionals currently providing nutrition services (medical doctors and nurses) in the public and private sector.
- Dietitians employed in the private sector.
- Dietitians based at other levels of the public health care system (e.g., PHC facilities such as PHC clinics and Community health centres (CHCs), district hospitals, regional hospitals (except for purposes of the pilot study), specialised hospitals, district offices, provincial offices and the NDOH.
- Other nutrition professionals (e.g., nutritionists) whose current scope of practice doesn't allow for the provision of certain nutrition services at the hospital level.

1.6 Rigour of the study

1.6.1 Validity and reliability

The online Qualtrics tool licenced through the University of Pretoria was used to prepare questionnaires for all data collection in the study. A survey was used as part of the preparatory phase to obtain and confirm data on the current distribution of dietitians at South African public hospitals as a baseline for the consensus phase (Appendix 1). The initial online questionnaire developed for the iterative online survey (consensus phase) was pre-tested through a pilot study conducted with dietitians at SA regional public hospitals.[26] Participants of the study were required to evaluate the draft pilot questionnaire (Appendix 2) for clarity of concepts,

phrasing of questions, relevance to the target group, length and time allowance, and overall user-friendliness based on the evaluation form (Appendix 3). The pilot questionnaire was then revised and improved based on the responses received from participants resulting in the Delphi Round one questionnaire (Appendix 4). The online iterative questionnaires for rounds two and three followed the Delphi technique as guided by literature and group consensus (Appendix 5 and 6).[27-29] Some components contributing to the rigour of this study using the technique included: the use of a panel of experts, an online platform that does not meet face-face, the use of sequential questionnaires to obtain expert opinion and the guarantee of anonymity for participant responses. In addition, the stability of responses between the concurrent rounds added to the reliability of the study. Participant responses, although anonymous were summarised and shared with all participants between the rounds. Thus allowing for evaluation of the responses by all participants in consequent rounds of the consensus process once again contributing to the reliability in obtaining consensus on the final Workload components (WC) and Activity Standards (AS).[28] In addition the use of experts with both an interest and expert knowledge on the subject matter increased the validity of the technique.[27] Whilst, the validated WHO WISN method was used for all calculations required to develop the framework as outlined in objective four of the study.[12]

1.6.2 Control of bias

Participants received all communication via email and were invited to participate in the study. Reminder emails were sent if there was no response to the initial email following the deadline date and participants were allowed the opportunity to nominate another representative from the facility should he/she be unwilling or unable to participate. Reminder emails were followed up with a telephone reminder and if there was no response then the researcher did not pursue the participant any longer to avoid any coercion and to prevent compromising the integrity of the study. No face-to-face meetings took place further reducing bias and coercion.[28] Quasi anonymity was used to ensure that judgements and opinions of respondents remained strictly confidential.[28,30]

1.7 Ethical considerations

1.7.1 Participant consent

Participants were adequately briefed on the study details and invited to participate in the study. All study details were included in the information and informed consent document (Appendix 7 and 8). Consent to participate was completely voluntary and only consenting individuals were included in the final study sample.

1.7.2 Participant Information and Information consent form

Information and informed consent documents as used for provincial nutrition managers and head dietitians at central and tertiary public hospitals are included in Appendix 7 and 8.

1.7.3 Ethical principles

The four principles of ethics were addressed in this study as follows: [30]

Autonomy or respect for others

The researcher ensured that all participants were given the freedom of choice to participate without any pressure to do so. All participants were required to sign informed consent to participate in the study as per Appendix 7 and 8. In addition, all participants were provided the opportunity to exit the study at any given point without having to provide any reasons for doing so. The researcher aimed to ensure that all participants were treated with respect throughout the study and provided the freedom to express their opinions and viewpoints as participants of the study. All questions to participants considered religious and cultural aspects and these were well respected. The study was structured in accordance with the Declaration of Helsinki and participants were offered a copy if required.

Beneficence

This study aimed to provide further progress in nutrition research for the dietetic cadre and for the future planning of dietitians at central and tertiary public hospitals. An adequate description of the study including study processes and participant requirements (Appendix 7 and 8) allowed participants an understanding of the purpose and expected outcomes of the study prior to their voluntary acceptance to participate.

Non-maleficence

The researcher endeavoured to do no harm and to ensure a low risk for any potential harm during the study. No patients or any personal information of the expert panellists were included in the study. The study only included data to assist in reaching and finalising the aims and objectives of the study. Quasi- anonymity and confidentially was maintained throughout the study. The use of an online platform served beneficial and feasible in allowing ease of participation across the country for consensus on expert opinion.[26]

Justice

Participants were treated with fairness and equality throughout the study. The researcher intended to include all central and tertiary public hospitals in the study to ensure fairness and equality in representation across the country. However, one tertiary hospital was left out of the final sample due to approval not being obtained from the hospital in time. This was beyond the control of the researcher as the study needed to continue to meet both ethics approval and other hospital approval timelines. The outcomes of the study will be shared with all provincial nutrition managers and dietitians at central and tertiary hospitals to allow for justice such that their participation allows them in benefiting from the outcomes of such a study.[30]

1.7.4 Approval

Ethics approval for the study was obtained from the Research Ethics Committee, Faculty of Health Science University of Pretoria prior to initiating the study and for the period of the study (97/2021- Appendix 9). The researcher also registered and obtained approval to use department of health information through registration on the National Health Research Database (NHRD). Approvals were obtained through provincial research committees and in certain cases through hospital research committees as applicable (Appendix 10).

1.8 Conflict of interest

The researcher is currently an employee of the National Department of Health and a student at the University of Pretoria for purposes of completing a PhD. It is declared that all work done for the purposes of this study was performed in an academic manner to fulfil all necessary requirements as stipulated by the University of Pretoria for the purposes of a PhD in Dietetics degree. All necessary approvals were obtained as required through the appropriate channels. This study aimed to academically position this work to allow for further improvements in dietetics.

1.9 Layout of the Thesis

The main text of the thesis is presented as follows:

Chapter One: **Introduction**: This introductory chapter of the thesis covers the following sub-sections:

- Background and rationale of the study
- The core research problem and its significance
- Problem statement
- Study aims and objectives.
- An overview of the study methodology
- Rigour of the study
- Ethical considerations

Chapter Two: Literature Review: This chapter provides a summary of the literature as detailed in the following sub-sections:

- Introduction
- Health workforce planning
- Human resource for health planning approaches
- The WHO Workload Indicators of Staffing Need (WISN)
- Conclusion

Chapter Three: **Published Manuscript:** *A Delphi Consensus Study to Determine the Workload Components and Activity Standards of Dietitians in South Africa`s Central and Tertiary Public Hospitals.* This chapter presents the publication that appears in the BMC: Human Resources for Health Journal. This paper focussed on the findings from both the preparatory and consensus phases and thus includes information related to objectives one, two and three as depicted in figure 3.

Chapter Four: **Unpublished Manuscript One:** *Application of the Workload Indicators of Staffing Need: A Case Study of the Dietetic Workforce at South African Central and Tertiary Public Hospitals.* This chapter presents the first manuscript detailing a case analysis conducted at 21 central and tertiary public hospitals and covers information from the preparatory, consensus and finalisation phases. Thus, relating to objectives one, two, three and four in varying degrees as depicted in figure 4.

Chapter Five: **Unpublished Manuscript Two:** *A staffing norm framework and implementation tool for dietitians: a South African Workload Indicators of Staffing Need (WISN) study.* This chapter presents the second and final manuscript and covers the development of the framework and implementation tool related to the preparatory, consensus and finalisation phases as depicted in figure 5.

Manuscripts one and two have been submitted to the BMC: Human Resources for Health Journal for review with the following manuscript numbers:

Chapter four Manuscript One: HRHE-D-23-00110

Chapter five Manuscript Two: HRHE-D-23-00171

Proof of submission of both manuscripts is included in Appendices 11 and 12.

Chapter Six: **General Discussion and Conclusion**: This chapter provides an overall discussion of the final study findings together with a conclusion of the study results and recommendations.

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CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter aims to provide a review of the literature with a broad overview of health workforce planning both in the global and African context. It provides details on available Human Resource for Health (HRH) approaches, including their advantages and limitations. Major databases including Medline, PubMed, and Google Scholar were searched as well as journals that publish issues on health workforce such as the BMC Human Resources for Health Journal. In addition, the World Health Organisation website was searched. The keywords used as part of the search strategy included `HRH`, `Human Resources for Health`, `South Africa`, Staffing approaches, 'Staffing Need`, 'workload indicators staffing needs', and WISN'. Only articles published in the English language were used in the study.

2.2 Health workforce planning

Globally there is a move towards achieving Universal Health Coverage (UHC) to improve access to quality essential health care services for all.[1] One of the key areas contributing towards achieving this is dependent upon the `recruitment, development, training and retention of the health workforce.` and the consequent development of the global HRH strategy.[2] Objective two, of the global HRH strategy stresses the need for an investment in HRH to address shortages and to improve the distribution of health workers.[2] If we had to revisit the global milestone for 2020 as related to objective two of the global strategy: `All countries should have made progress on health workforce registries to track health workforce stock, education, distribution, flows, demand, capacity and remuneration'.[2] The World Health Organisation (WHO) global health statistics in 2019 indicated concerns around the global health situation and an additional necessity for an emphasis on HRH.[3]

Data illustrates that the African region as defined by WHO has the greatest shortages in health professionals, with fewer than 10 medical doctors per 10 000 population and fewer than 40 nursing and midwifery personnel per 10 000 population between 2013 and 2018.[3] Africa is said to shoulder 24% of the worlds disease burden whilst only employing 3% of the worlds health workers.[4] In addition, the COVID-19 pandemic has had a detrimental effect on health workers leading to loss of life and physical and emotional exhaustion.[4] Hence, the pandemic only re-enforces the need to ensure a more sustainable supply of skilled health workers to meet the demands of health services.[4]

South Africa has a higher health worker density than most African countries, however the country still struggles to provide appropriate access, quality, and equity when related to health worker distribution.[5] The South African health care system has two fragments which include both public and private sectors. "Even though the health system consumes about 8.8% of the country's gross domestic product, only 4.1% goes towards the public sector which serves 84% of the population."[6] Thus, indicating an uneven distribution of financial resources. By 2030, the health system should be able to provide quality care to all, free at the point of service, or paid for by publicly provided or privately funded insurance through the NHI.[7, 8] For this to materialise, it requires adequate implementation of both financial and human resource planning, development and management.[8]

2.3 Human resource for health planning approaches

2.3.1 Traditional approaches

The outcomes of the methods used to determine staffing norms is ultimately, what determines its effectiveness. Traditional approaches used over the years for health workforce planning include the workforce-to-population ratio method, the health needs-based method, the service demands based method, and the service targets method.[9-13] These methods do provide guidance to determine overall staffing requirements, however, they are not without limitations and challenges. A study conducted by Dreesch et al,[14] summarises the advantages and limitations of these approaches used to estimate requirements for human resources for health as shown in Table 1.

Health workforce to population ratio is said to `specify desired worker-to-population ratios`.[14] Although quick and simple to apply and understand, this method does not consider the complexity of work, acuity of work, risk in different care settings and the multiple roles and responsibilities of staff.[10, 13-16] In addition, evidence indicates that staffing ratios based on hospital beds also do not adequately determine the requirement for staff in hospitals and can result in an over-estimation or an under-estimation of staff in different settings.[13-15]

The health needs-based method, "estimates future requirements based on estimated health deficits of the population, taking into account age, gender, service needs and converts projected service needs to personnel requirements using productivity norms and professional judgements".[14] This method accounts for a skill mix of HRH when determining the health needs of the population, however, it requires extensive data and the updating of staffing norms especially if technology changes occur. However, such a method may have the potential to project unattainable service and staff targets.[14]

The service demands-based method "estimates future requirements based on current level of service utilization in relation to future projections of demographic profiles".[14] The method provides economically feasible targets but assumes future projections to be the same as base utilisation rates.[14]

The service targets method "sets targets for the production and delivery of specific outcome-oriented health services.[14] Converts these targets into HRH requirements by means of staffing and productivity standards". It is easy to understand and assesses interactions between variables, whilst having the potential to provide unrealistic assumptions.[14]

Table 1. Traditional Approaches Used to Estimate Human Resource for Health Requirements[14]

Approach/Staffing Method	Advantages	Limitations
The workforce-population ratio method	• Quick, and easy to understand. • Simple projections using proposed thresholds for workforce density. *(e.g., number of dietitians per 10 000 population)*	• No insight into personnel utilisation. • Potential unrealistic assumptions such as: o members of the cadre are productive and will remain as such. o populations have similar needs, and these will remain constant.
The health -needs method.	• Uses a mix of HRH to determine population needs. • Independent of current health service utilisation. • Logical an easy to understand.	• Requires extensive data. • Requires updates if changes in technology occur. • May project unattainable service and staff targets.
Service demands-based method	• Economically feasible targets (based on little or no change in utilisation rates)	• Requires extensive data. • Assumes futures projections to have the same utilization rates as the base year.
Service targets method	• Easy to understand. • May assess interactions between variables.	• Potential for unrealistic assumptions

2.3.2 Other approaches

Alternative approaches mentioned in the literature include i) health condition specific, for example the "five-step-needs based approach to estimating psychiatric workforce requirements[17, 18] and the demand driven model using spreadsheet technology to estimate workforce requirements for HIV patients,[17, 19] ii) time needed to address deficits of the population,[14, 17] and iii) cadre specific approach for example the British Dietetic Association

(BDA) toolkit in the context of dietetics.[20] However, Ward et al, in a 2015 study concluded that such a toolkit is also not accurate and does not reflect the actual time spent on activities. That study also found that dietitians in paediatric wards only spent one fifth of the working day directly with patients.[20] It is vital that time spent on patient communication, administration and other activities are also factored into planning the staffing needs for dietitians.[20] Hence the need to move from facility based staffing norms to workload based staffing norms.[9, 21]

Overall, the traditional methods and alternate approaches mentioned in the literature have constraints, because they do not account for variations in different countries, differences in morbidity patterns, differences between facilities and patient attitudes.[10, 14] As a result, the World Health Organisation (WHO) saw the need for a more systematic approach.[10] This led to the publishing of the Workload Indicators of Staffing Need (WISN), aimed at determining fair and optimal distribution of staff at health facilities and an approach that accounts for the variations in the demand for services and the work that health workers actually do.[10-15] Basic health workforce planning models should be able to analyse the supply, demand, gaps and provide solutions to allow for effective HRH planning even in situations where there may be a sudden surge in patient numbers.[22, 23] It is said that "the WISN method is easier to comprehend and use, much simpler and its information system is consistent and reliable", when compared to other alternate approaches.[17]

In SA, there is currently no guidance document to determine staffing requirements at a hospital level.[5] However, objective 1.2 of the SA strategy for HRH 2030 is aimed at `Applying strategic health workforce modelling and planning to optimise investment in HRH`, which includes the development of a comprehensive and approved national model for health workforce forecasting and planning.[5] One of the many activities related to this objective includes the re-evaluation and possible use of WISN in national HRH planning.[5] Hence, this literature review provides a more detailed focus on the application of WISN as a workforce planning tool.

2.4 The WHO Workload Indicators of Staffing Need (WISN)

2.4.1 WHO WISN background

WISN was first introduced by Peter J Shipp in 1998 to assist with `the optimal allocation and deployment of current staff both geographically and functionally.[24] It was aimed at taking into consideration staffing patterns, levels, and staff categories. As this technique was aimed to assist both medical and non-medical administrators it was thus designed for: simple operation, technical acceptability, comprehensibility and to be realistic.[24] Following its implementation in 2008, WISN underwent a review process based on some limitations and difficulties in applying

the initial approach in different settings.[10] This led to the introduction and implementation of the reviewed WHO WISN manual and its automated software in 2010.[10] It is thus described as a human resource management tool that "determines how many health workers of a particular type are required to cope with the workload of a given health facility."[10] It further assesses "the workload pressure of the health workers in the facility."[10] The WISN methodology is constructed in the form of eight steps as shown below in Table 2.[10]

Table 2. The WHO WISN Eight-Step Methodology[10]

	The eight steps of WISN
1.	Determining priority cadre(s) and health facility type(s)
2.	Estimating available working time
3.	Defining workload components
4.	Setting activity standards
5.	Establishing standard workloads
6.	Calculating allowance factors
7.	Determining staff requirements based on WISN
8.	Analysing and interpreting WISN results

Although WISN can be applied to all health worker cadres and all facility types, each WISN exercise requires the user to determine the priority cadre(s) and define the health facility type(s) to allow for an adequate allocation and planning of resources.[10] Secondly, the tool necessitates the need to estimate the available working time of the defined cadre(s). Available Working Time (AWT) is defined as "The time a health worker has available in one year to do his or her work, taking into account authorised and unauthorised absences." This ensures that annual, sick, and other leave (e.g., training) and public holidays etc, as defined by local labour laws are either accounted or compensated for as part of the staff calculations.[10]

Steps three and four refer to the defining of workload components and the setting of activity standards. Workload components include "work activities that take up most of a health worker`s daily time", whilst activity standards "is the time necessary for a well-trained, skilled and motivated worker to perform an activity to professional standards in the local circumstances".[10] Workload components are further categorised into health, support, and additional service activities. Health service activities are "performed by all members of the staff category".[10] Secondly, support service activities are "performed by all members of the

cadre, but regular statistics are not collected on them".[10] Lastly, additional service activities are" performed only by certain members of the cadre, regular statistics are not collected on them".[10]

Regular Expert working groups can be used to define these and can include either cadre based, or facility based expert groups as applicable. Cadre-based expert groups usually include senior representatives of one cadre and can provide professional expertise and experience for the given staff category.[10] A facility based expert group includes senior professionals from all departments or disciplines of a given facility to define standards for all cadres in the facility. However, these facility-based groups may not have the expert knowledge required to define activity standards for all cadres and may still need to depend on cadre based expert groups.[10]

The finalisation of the previous steps, allow for the calculation of standard workloads (step 5) which WISN defines as "the amount of work within a heath service workload component that one health worker can do in a year".[10] However, these standard workloads only account for health service activities for which routine statistics are collected. Therefore, there is still a need to account for other activities that do not require the collection of statistics. Step six accounts for the calculation of allowance factors that consider both support and additional service activities. The category allowance factor "is used to calculate the total number of health workers required for both health service and support service activities".[10] While the individual allowance factor "is the staff requirement to cover additional activities of certain cadre members".[10]

The data obtained in the previous steps allow for the final determination of staffing requirements based on WISN calculations and using health facility specific data (step 7). These can be done either manually based on the calculations provided in the WISN manual or the automated WISN software may be used for user-friendliness.[10] These final calculations allow for the analyses and interpretation of the WISN results (step 8) which can be done by looking at either the WISN difference or the WISN ratio or both.[10] The WISN difference compares the difference between current and required staffing levels, thus providing an indication of either under or overstaffing in the facility. Whereas the WISN ratio is a proxy measure that assesses the level of work pressure that health workers experience in the facility.[10] Therefore, WISN indicates ideal characteristics of a workforce planning model that has been widely used. Literature indicates that the WISN users' community includes over 140 countries with close to 1500 members sharing experiences on the use of the tool.[25]

2.4.2 WISN in the global context

Numerous WISN studies report on the application of the WISN tool worldwide, mainly in developing countries. These include Vietnam, the Philippines, Pakistan, Oman, Papua New Guinea, Iran, Iraq, Serbia, Brazil, Bangladesh, Peru, Indonesia and India to name a few.[6, 22, 23, 26-33] Such studies have shown its application across several health platforms namely, clinical biochemical laboratories, primary health care, the district, tertiary and palliative care hospitals, and have also been used across districts and at a country level.[6, 22, 23, 26-28, 30-32] Various cadres included are nurses, physicians/doctors, midwives, medical technologists, pharmacists, laboratory/radiology technicians, health extension officers (community health workers), medical biochemists, social workers, physical therapists, nutritionists, and psychologists.[6, 22, 23, 26-28, 30, 31] However, one study conducted by Gialama et al has also shown the application of WISN in the developed context..[17] The tool was used in this study to estimate the required number of midwives based on their workload and workload pressures at four different Greek hospitals.[17]

2.4.3 WISN in the African context

WHO indicates that African countries have a great need for a tool to assist in determining staffing norms at facility levels.[10] The WHO WISN tool was thus implemented in a number of African countries and found to be useful.[11, 12] These countries include Mozambique, Uganda, Burkina Faso, Ethiopia, Ghana, Kenya, Mali, Namibia, Nigeria, Malawi and South Africa. WISN has also been applied and field tested in a number of countries.[10, 13, 34, 35] Country experiences and case studies applying the WISN method in Mozambique and Uganda showed that most health worker cadres were working under pressure due to staff shortages.[12, 34] Their recommendations indicate that WISN should involve all relevant stakeholders to yield better results and should be integrated into the existing health system.[10, 34] It is said that WISN can assist in providing information required for policy planning, development and the revision of staffing norms in determining actual staffing needs.[25, 26, 31]

2.4.4 WISN in the South African context

WISN was introduced into the SA PHC setting in 2012 with the development of a WISN based normative workforce guideline to support its implementation in 2015.[6, 36] This included the official appointment of national and provincial WISN coordinators who were trained and continued to receive expert guidance from WHO experts.[36] A study conducted by Mabunda et al reported lessons learnt from WISN implementation in three countries including SA.[6] This study reported that in SA, results showed that the average variance between the existing

number of posts and the WISN determined posts was 4418, thus posing affordability challenges with an additional (Rands) 1,901,082,324 required to fund such posts.[6] Limitations or challenges of the implementation process related to the accuracy of health service statistics, inability to differentiate between facilities where available working times varied, in instances where similar activities were performed by several different cadres and the consideration of the specific needs of rural settings.[6] Some recommendations from the study included the need for appropriate consultation with relevant stakeholders such as the Departments of National Treasury and Public Service to assist in planning towards a workforce that the country can afford.[6] Furthermore, the strengthening of computer literacy amongst health workers and data collection systems were further recommended for future planning.[6]

2.4.5 Advantages of WISN

The tool can be used by managers at national, regional, district or facility level and may be applied to any specific cadre of health workers.[16, 25, 26, 29, 37, 38] WISN studies recognise the need to prioritise various health professional cadres, instead of only focusing on traditional cadres such as doctors and nurses.[25, 39] WISN is said to be a simple, objective and reliable means of estimating staffing needs.[31, 40, 41] A scoping review conducted by Doosty et al in 2019, indicates, the tool "can be cost saving, simple and a comprehensive approach", with a practical and realistic method, allowing for the forecasting of staffing needs and applicable to all kinds of staff in all regions.[21] The tool allows for the prioritization of staffing cadres but still requires the support of managers for implementation.[21]

Findings indicate that there are differences in health care models, health care teams, Workload Components (WC) and Activity Standards (AS) between countries. Hence, these activities cannot be adopted from one country to another and requires the development of context specific WC and AS.[33] As a result the use of these WISN WC and AS, was found to be valuable in prospectively measuring activities and translating workloads into the actual number of staff required. Thus, displaying health worker shortages and inequities in their distribution and providing the potential to reduce costs.[15, 34]

Furthermore, country experiences show that several cadres seem to dedicate more time to support activities than their defined health service activities, often due to the shortage of support staff.[10, 34] This highlights the need for staff categories to have clearly defined roles and responsibilities based on their scope of practice and defined competencies.[11, 35] WISN can assist in determining the amount of time that is spent on specific work activities, allowing for task shifting to mid-level workers on certain areas.[42] Such benefits of the tool can assist in

reducing the required number of certain health professional cadres thereby also diminishing costs.[30, 35]

It is said that the tool may actually assist facilities to improve recordkeeping and data collection based on the outcomes of the WISN results thus resulting in an advantage rather than a limitation.[15] WISN may also be used in conjunction with other HRH models.[25, 43] The tool can be implemented as a long term intervention with appropriate integration into HRH management.[40] The long-term forecasting and planning of staffing can benefit from the use of WISN as a monitoring tool through periodic reviews in determining staffing needs.[27, 31, 32, 41]

2.4.6 Challenges, limitations and recommendations related to WISN

An assessment of the WISN methodology showed that there seemed to be consensus regarding the practical use of WISN although there were some challenges in certain steps.[43] These included poor data quality and poor enabling human resource policies for implementation. However, a phased approach of WISN can make for easier implementation and better outcomes.[43] In addition, other recommended enabling factors included the use of the WISN software, WISN user's manual, WISN training for senior management to allow for better implementation in avoiding such challenges.[43]

The tool cannot be generalised for different areas as it is related to topography, climate and population densities, therefore it encourages the development of context specific needs.[21, 25] Secondly, the incorrect interpretation of the results especially in situations where there may be a lack of recordkeeping or statistics may under-estimate staffing requirements and thus the need to adjust for these accordingly when finalising recommendations.[21, 32] Lastly, health environments are constantly changing and thus it is vital that staffing norms are reviewed frequently to ensure that it accommodates for these changes.[21] Whilst, WISN predictions can be faced with affordability issues, it is recommended that the tool can still be used to model staffing requirements that can be achieved overtime whilst, taking into consideration available resources.[6]

2.5 Conclusion

Studies have revealed that WISN is an effective tool in workforce planning, and it can be used in combination with other models, providing a more comprehensive approach.[25] Therefore, even in the context of the dietetic cadre it seems that a more systematic approach such as WISN may be a preferable option, especially in the absence of such guidance currently. Whilst SA has tried its implementation in the PHC setting, such implementation has not been explored in the hospital setting. As small-scale implementation is recommended, this study

aimed to focus only on the central and tertiary public hospitals as an initial step in determining the staffing needs of dietitians in SA. Limitations of the WISN methodology highlighted in the literature together with recommendations on possible ways to adjust for them were taken into consideration as part of this study.[6, 21, 43]

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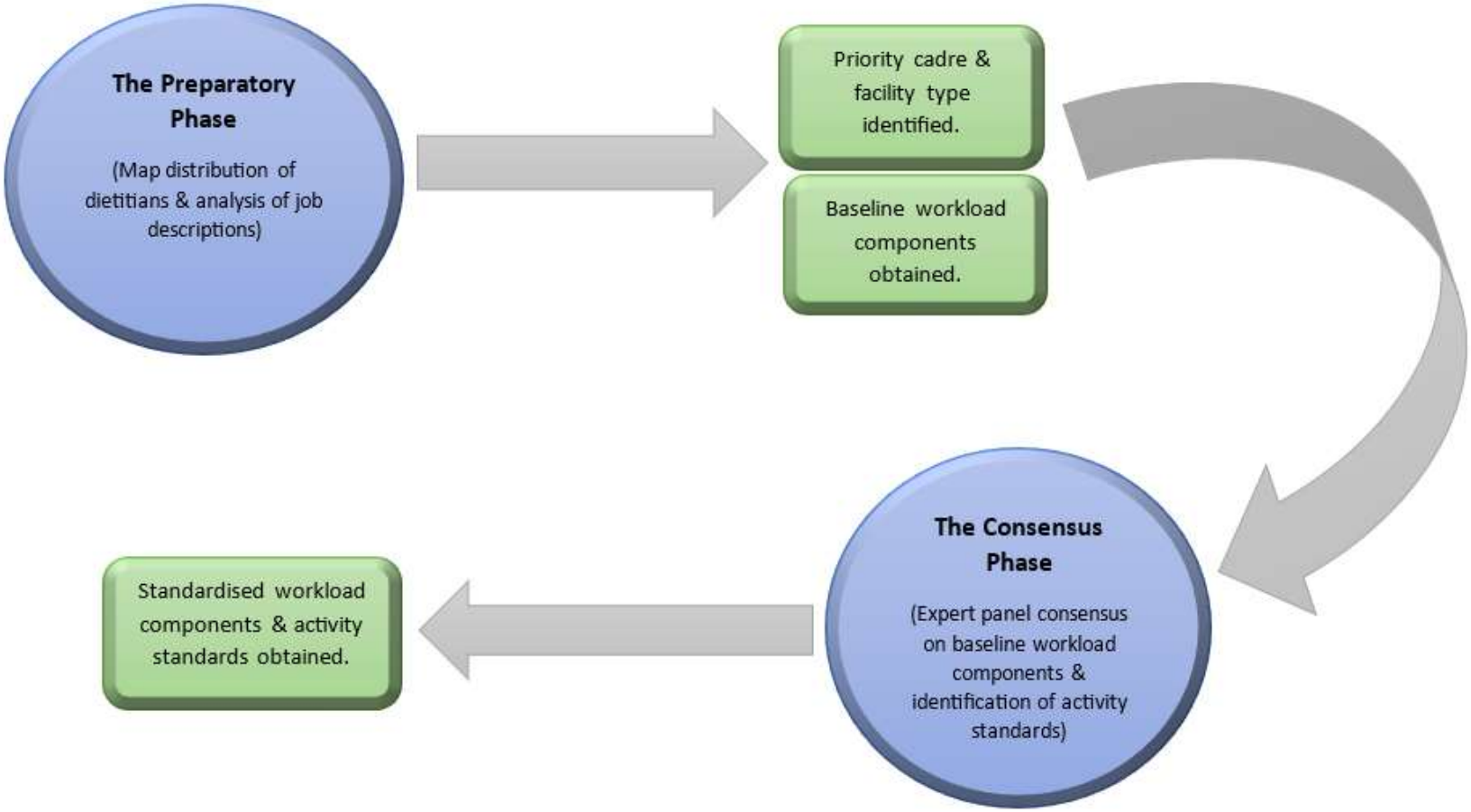

Figure 3. Preparation and Consensus Phases: A Delphi Consensus Study to Determine the Workload Components and Activity Standards of Dietitians in South Africa`s Central and Tertiary Public Hospitals

CHAPTER THREE: PUBLISHED ARTICLE

This chapter provides information on the preparation phase which included an assessment of the status and distribution of dietitians at public hospital level in South Africa. Thus, providing a baseline for the selection of the priority cadre and facility type being central and tertiary public hospitals (Step 1 of the WISN methodology). Secondly, in the preparation phase job descriptions of dietitians at these levels of care were collected and analysed providing baseline data on the activities performed by dietitians. Steps 3 and 4 of the WISN methodology required the standardisation of workload components and activity standards for the identified priority cadre and facility type. Hence, this chapter details an online Delphi consensus study conducted at 21 South African central and tertiary public hospitals using the baseline data obtained in the preparation phase. The result of this paper provides a standardised list of workload components and activity standards for dietitians at South African central and tertiary public hospitals.

The chapter includes the published article as it appears in the BMC: Human Resources for Health Journal. The publication is referenced as follows:

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Human Resources for Health

RESEARCH Open Access

A Delphi consensus study to determine the workload components and activity standards of dietitians in South Africa's central and tertiary public hospitals

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Abstract

Background The global Human Resources for Health (HRH) strategy emphasizes the need to invest in HRH to meet population needs and improve the provision of quality health care services. In South Africa, dietitians are recognized as registered professionals who provide nutrition services. In this paper, we used 2 key steps (3 and 4) of the eight step World Health Organization (WHO) Workload Indicators of Staffing Need (WISN) methodology to determine the workload components and activity standards for dietitians at South African central and tertiary public hospitals.

Methods All (9) provincial nutrition managers (phase one) and 21 out of a total 22 head dietitians at central and tertiary public hospitals (phase two) participated in an online survey. In phase one, the provincial managers provided the job descriptions (JDs) of dietitians in their provinces, and the JDs were analyzed to determine the baseline workload components. In phase two, dietitians participated in a multi-stage Delphi process to reach consensus on workload components and activity standards. Consensus was deemed to be agreement of 70% or more, while the median of participants' responses was used to obtain consensus on the activity standards.

Results The JDs of dietitians were a useful baseline for the consensus exercise as there were no other suitable source documents. The response rate was 100% for all three rounds of the Delphi survey. Dietitians reached agreement (consensus ≥ 70%) on 92% of proposed workload components and activity standards. Following the removal of duplicate and certain administrative activities, a total of 15 health, 15 support and 15 additional service activities with aligned activity standards resulted from the consensus exercise.

Conclusion The Delphi technique was a suitable method for reaching agreement on workload components and activity standards for dietitians at South African central and tertiary public hospitals. The findings from this study can now be used to compile a standardized list of workload components and activity standards and ultimately to determine dietetic staffing needs for the central and tertiary public hospital level of care.

Keywords Activity standards, Delphi, Dietitian, Hospitals, South Africa, Staffing need, Workload components, Workload indicators

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Background

Globally, there is a pressing need to invest in human resources for health (HRH) to address shortages and improve the distribution of health workers, ultimately ensuring universal health coverage [1]. South Africa, compared to other African countries, has a higher health worker density (> 4.45 per 1000 population) meeting the proposed Sustainable Development Goal index threshold [2]. However, the availability of health workers alone is insufficient; accessibility, acceptability, and quality of health workers are crucial factors to truly make a difference [1, 2]. Recognizing this need, the South African HRH strategy was developed through a ministerially appointed task team [3], with the aim of investing in the country's workforce. While the strategy included health worker densities for several disciplines, it did not provide any data specifically for dietitians [3].

Dietitians are recognized as registered professionals responsible for providing community nutrition, therapeutic nutrition, and food service administration in South Africa, making them significant contributors to both preventative and curative services [4]. However, the absence of a national workforce planning tool to address nutrition workforce challenges can hinder the effective implementation of nutrition interventions and their desired outcomes [5]. The WHO, Workload Indicators of Staffing Need (WISN) tool has been successfully implemented for evidence-based workforce planning in several countries [3, 6–9]. The tool assists policymakers and managers in improving staffing equity across regions and facility types by developing workload components and activity standards tailored to specific disciplines [10–13]. While WISN has been implemented in South Africa previously to determine staffing needs in the primary health care setting, further research is needed to evaluate its suitability in the hospital setting [14].

The WHO WISN methodology consists of eight steps for determining workforce requirements. Steps 3 and 4 involve gathering key information required in the method, namely activities performed by a given cadre on a daily basis at a specific health service delivery level (i.e., workload components), and the time it takes a cadre to conduct these activities (i.e., activity standards), respectively. Therefore, defining of workload components (step 3) and setting of activity standards (step 4) based on the WISN methodology can assist in determining the actual work activities that take up most of a dietitian's daily working time [6]. The development of these country, context and dietetic specific workload components and activity standards formed an essential component of the broader study whose aim is to develop a staffing norm framework for dietitians [6, 12]. Cadre-based expert working groups can be used to define these 'two crucially important steps in the WISN method' [6]. The Delphi technique, a method introduced in 1963 to obtain reliable opinion consensus of a group of experts through controlled questionnaires and feedback [15], was employed in this study. The online Delphi method was found to be the most feasible approach to gather input from head dietitians from 21 different hospitals and the nine provinces of South Africa, forming a cadre-based expert consensus group for this study [16, 17]. This technique has been widely used in various disciplines due to its cost-effectiveness and convenience when dealing with incomplete knowledge [17, 18]. Using a panel of experts, an online platform for questionnaire distribution, sequential questionnaires, and guaranteed anonymity for participant responses, the Delphi method enhances the rigor of studies and provides a quick and simple way to obtain data and guide group opinion towards consensus [16, 17, 19].

Currently, the professional scope of dietetics only provides a broad overview of the activities as related to dietetics in South Africa and does not provide a detailed guide for the specific daily work activities of dietitians [4]. Furthermore, the Health Professions Council of South Africa does not provide a scope of practice for dietitians. To determine the specific daily work activities of dietitians, we relied on the job descriptions (JDs) of dietitians as an appropriate source document. This helped establish an initial baseline and provided a focused framework for the Delphi consensus exercise [4, 17, 19]. The purpose of this paper is to describe the process followed in gathering expert opinions from dietitians and identifying consensus regarding the proposed dietetic WISN-based workload components and activity standards [6, 20] for central and tertiary public hospitals. Central and tertiary hospitals offer similar services; however, central hospitals serve a larger population. This study is a part of a larger study to determine the staffing needs of dietitians at this level of care.

Methods

Participants were selected using non-probability purposive sampling methods to ensure appropriate representation [17, 18]. Data collection took place from February 2022 to May 2022. Data were collected in two phases.

In phase one, all nine provincial nutrition managers representing South Africa`s nine provincial health departments consented and participated in an online survey. The managers provided the JDs of dietitians working in their provinces. The JDs were then thematically analyzed using Microsoft Excel. The thematic analysis was done according to the three categories of the WISN workload components which formed the baseline for phase two of the study [6]. Health service activities were defined as "activities performed by all dietitians and

for which annual statistics are regularly collected." Support service activities were defined as "important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected." Lastly, WISN defines additional activities as "activities performed only by certain members of the staff category and for which annual statistics are not regularly collected" [6].

Phase two included 21 out of a total 22 head dietitians at central and tertiary public hospitals who consented to participate in a survey using the online Delphi technique [21]. Although the ideal number of participants for a Delphi exercise is unspecified, approximately 10–15 participants may be sufficient for a homogenous sample [18–20]. By selecting the head dietitians of hospitals, we ensured that the participants were representative of dietitian work activities [16, 18]. Participants were given details about the study (purpose, their role as participants, the process, and expected outcomes) prior to commencement. This was done via email and participants were also offered the opportunity to have either telephonic or virtual meetings for further clarification if required [18]. Questionnaires in all rounds were presented as three parts: Part A: health service activities, Part B: support service activities, and Part C: additional activities together with aligned definitions to allow for a clear distinction between the three categories [6]. Participants were given the definition of activity standards "the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances" [6] and they were asked to provide the time required to perform each of the activities in the three workload component categories. Participants completed structured questionnaires including both closed and open-ended questions or practice statements during each of the three rounds until consensus was achieved [18]. Closed-ended questions or practice statements were presented using a 5-point Likert Scale (strongly disagree, disagree, do not disagree or agree, agree, and strongly agree). We piloted the first-round questionnaire to assess user-friendliness. Dietitians from regional, rather than central and tertiary public hospitals, participated in the pilot study to avoid possible contamination [17, 20, 21]. Participants were asked to evaluate the pilot questionnaire for clarity of concepts, phrasing of questions, relevance to the target group, length and time allowance, and overall user-friendliness.

The second and third questionnaires were based on the responses obtained from the first and second rounds, respectively [16]. Participants had two weeks to complete each round and were sent reminder emails before the deadline [18]. Participants requesting more time to complete the questionnaire were accommodated with reasonable extensions to avoid delays in subsequent rounds. Data were collected using Qualtrics, which allowed participants the flexibility and freedom to complete questionnaires without imposing on daily activities [18]. Following each round, we gave controlled feedback giving the participants an opportunity to revise their opinions with an informed knowledge of the views of the other participants [16, 18, 22]. Following the final round of the Delphi survey, we aggregated the data to identify the final workload components and activity standards [22]. Data were analyzed using Microsoft Excel and the Statistical Package of Social Sciences (SPSS). The agreement threshold for the Delphi technique depends on sample size, aims of the research, and resources available for the study [18]. In our study, we applied a 70% agreement threshold, as previously recommended, while considering the stability of responses between rounds [17, 18].

We also concurrently determined the activity standards of the aligned workload components as proposed by the participant group. Final activity standards were based on the median of the responses obtained [18]. The final lists were deemed as a standardization of WISN-based workload components and activity standards for central and tertiary public hospitals based on the expert opinion of head dietitians [6].

Results

Phase one: job descriptions

Of the 21 South African central and tertiary public hospitals, filled dietetic posts are as follows: one hospital employs a Deputy Director (DD), nine hospitals have filled Assistant Director (ASD) posts, 20 hospitals have dietitians employed as Chief Dietitians (CD), and 20 hospitals employ dietitians in Production (PD) posts (entry-level dietitian). None of the 21 hospitals had dietitians employed in all four dietetic ranks from January to April 2022. We obtained JDs for all ranks (DD, ASD, CD, PD) of dietitians. Sixteen hospitals provided JDs of CDs, 14 provided JDs of PDs, while nine and one provided JDs for ASD and DD, respectively. The JDs were categorized into either health service activities (Table 1), support service activities (Table 2) or additional service activities (Table 3) workload components as defined in the WISN user's manual [6].

Phase two: the Delphi process

Round one

The 21 participants agreed on all 12 proposed health service activities (>85%). Participants proposed five additional health service activities (Table 1). These newly proposed activities were summarized and carried forward into round two. Fifteen of 16 support service

Table 1 Workload components and activity standards for health service activities

Heath service activities	Strongly agree (%)	Agree (%)	Do not agree/ disagree (%)	Disagree/ strongly disagree (%)	Activity standard (min per patient)
Delphi round one					
Ward rounds (individual and multidisciplinary)	95	5			10
Patient screening	71	14	15		5
Inpatient consultation and treatment (New)	100				30
Inpatient nutritional assessment (ABCDE) and diagnosis	100				15
Inpatient calculation of nutritional requirements and development of nutrition intervention plans	95	5			15
Inpatient nutrition support and dietary counselling	95	5			30
Inpatient consultation and treatment (follow-up)	95	5			15
Inpatient referral, communication with the multidisciplinary team and related activities	90	10			10
Outpatient consultation and treatment (new)	81	19			45
Outpatient nutritional assessment (ABCDE) and diagnosis	86	14			15
Outpatient nutritional plan and intervention including dietary counseling	86	14			30
Outpatient consultation treatment (follow-up)	67	28	5		30
Newly proposed health service activities: Delphi round two					
Outpatient consultation*	81	5	14		
Outpatient follow-up*	62	10	19	10	
Outpatient/specialist clinics (cerebral palsy, diabetes, etc.)	71	14	14		45
Report writing and patient notes	86	10	5		15
Referral process including writing of letters (between health facilities)	76	5	19		10

*Duplicate items were deleted from the final list of workload components

activities (Table 2) achieved agreement of 86 to 100%. One activity "monitor food services by an out-sourced company" scored 66%. Participants proposed an additional nine support service activities that were evaluated in round two (Table 2). Twenty of 22 additional service activities scored between 72 and 100%, meeting the consensus threshold. Two activities "ward rounds for food service" and "operational management of the human milk bank" scored 62% and 67%, respectively. Participants proposed seven new, additional service activities (Table 3). Activity standards were proposed for all agreed upon workload components in this round.

Round two

The second questionnaire was based on the responses obtained in the first round [19]. Participants were provided with an anonymous summary of all responses from round one and given an opportunity to reflect and revise their opinions [19], [23]. At this stage, participants were requested to propose activity standards for all newly proposed workload components. In round two, participants rated the newly proposed health service (Table 1), support service (Table 2), and additional service activities (Table 3). The five newly proposed health service activities scored between 72 and 96% agreement. Eight of the nine newly proposed support service activities scored between 71 and 100% agreement with the one activity "monitor and audit foodservices—in house or outsourced as applicable" scoring 62%. Six of the seven newly proposed additional service activities scored between 91 and 100% with one activity "outreach activities" only scoring 33% agreement.

Round three

We only re-visited activities that scored < 70%, representing diverging views of the participants. Participants were given another opportunity to review these activities and to justify or substantiate their scoring in this round [17, 19]. None of the health services activities scored less than 70%, so none if these activities were reviewed in round three. The support service activity "monitor and audit foodservices-in-house/outsourced as applicable" scored less than 70%. Three iterations later, the activity remained with a constant score of 62% showing little or no change in participant responses adding to the reliability of the responses [18]. Participants provided several reasons for either agreeing or disagreeing. Participants who agreed with the "monitor

Table 2 Workload components and activity standards for support service activities

Support service activities	Strongly agree (%)	Agree (%)	Do not agree/ disagree (%)	Disagree/ strongly disagree (%)	Activity standard (h per year)
Delphi round one					
Administrative functions related to ordering of specialized diets and therapeutic nutrition (PN and EN) [2]	81	14		5	96
Monitor wastage and usage of PN and EN[2]	76	19		5	48
Food service management (developing and updating of therapeutic diets and related diet sheets)	57	29	5	10	24
Monitor food service rendered by out-sourced company[3]	52	14	24	0	
Participation in journal reviews and working groups	76	10	14		38
Dietetics departmental meetings	86	14			38
Meetings with industry representatives and other stakeholders	52	43		5	18
Own performance development and management system (PMDS) reporting	90	10			8
CPD activities	81	19			24
Orientation of new staff*	76	24			24
In-service training to the multidisciplinary team and food service team*	71	24		5	12
Students mentoring (training), evaluation and reporting (including meeting with universities)	71	24	5		90
Attend training (generic)	76	19	5		18
Recordkeeping and statistics	86	14			48
Peer reviews and clinical audits	81	14	5		24
Development and review of policies, protocols, and guidelines (including related IEC materials)	76	19		5	36
Newly proposed health service activities: Delphi round two					
Outpatient health awareness events/campaigns/open days (planning and participation)	52	24	10	15	20
In-service training to the multidisciplinary team (nurses, doctors, etc.)	81	19			12
In-service training to the food service team	52	19	14	15	8
Dietetic administrative functions (telephone calls, emails, booking appointments, photocopying, etc.) [2]	48	29	10	15	191
Patient administration (patient handover, home care plans, recipes, etc.) [2]	57	24	19	0	153
Hospital committee/ Internal stakeholder meetings	52	43	5	0	44
Report writing (patient reports, medico-legal reports, etc.) *	43	29	24	5	38
The procurement process (ordering, receiving and monitoring of enteral feeds)*	67	14	10	10	137.5
Monitor and audit foodservices (in-house or outsourced as applicable) [3]	48	14	19	20	

* excluded from the final list due to duplication; [2]excluded due to low agreement, [3]excluded due to being administrative services that can be performed by other staff

and audit foodservices-in-house/outsourced as applicable" activity, explained that *"I would be in agreement, provided that a food service dietitian is employed at the tertiary setting."* Other participants stated that,

> *"Outsourced food services should be monitored/ audited at least once/quarter to monitor compliance to contractual stipulations. Food services have so many variables that need to be monitored, including compliance to menu's, production, portion sizes, financial parameters, ration scales, stock ordering, storage, shelf life of items, wastage of special diets, supplements - budgeting, costing, stock control."*
>
> *"Outsourced kitchens need to be supervised to ensure that patients are receiving what they are supposed to. To ensure patients are receiving quality meals. Monitor preparation and serving as well."*
>
> *"Monitoring and auditing of food services is essential as it has a direct impact on patient care. Current staffing however does not allow for this activity to the detriment of our patients."*

Participants who disagreed explained the following:

Table 3 Workload components and activity standards for additional service activities

Additional service activities	Strongly agree (%)	Agree (%)	Do not agree/ disagree (%)	Disagree/ strongly disagree (%)	Activity standard (h per year)
Delphi round one					
Managerial duties (risk management, planning of duty rosters)	86	14			24
Financial management (budgeting and procurement) *	76	24			24
Asset management and physical resource management*	67	24	10		24
Develop departmental plans (strategic, business, and operational)*	71	29			16
Develop and review policies/strategies/guidelines/protocols and norms and standards*	76	24	0		24
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	71	24	5		24
Human resource management (grievances and disciplinary processes, HPCSA registration and compliance, attendance and leave register)	86	5	10		48
Recruitment, selection, and appointment of new staff*	81	19			16
Training, support and supervision of lower-level staff and community service dietitians	90	5	5		191
Performance development and management system (PMDS)	90	10			20
CPD activities*	81	19			24
Report writing, validations, and presentations	67	29		5	36
Participation in accreditation of facilities for student training*	48	38	14		8
National core standards (QIP)-develop plans, evaluation, and reports	62	33		5	19
Planning and coordination of departmental meetings	76	24			36
District, provincial INP and allied meetings	76	10	10	5	24
Participation in research activities	57	33		10	24
Food service management, development and costing of therapeutic diets (cycle menus, menu analyses, standardize recipes)*	52	29	10	10	16
Education, training, and supervision of foodservice/diet kitchen staff/ milk kitchen/tube feed personnel	67	10	10	15	53
Ward rounds (foodservice)†	43	19	14	24	
Generate reports (meals, incidents, infection control)*	43	29	5	24	37
Operational management of human milk bank†	43	24	10	24	
Newly proposed health service activities: Delphi round two					
Outreach activities (Community or lower-level activities)†	14	19	33	35	
Hospital committee/ Internal stakeholder meetings*	48	43	5	5	44
MBFI mentor/committee participation and activities	43	33	19	5	24
Audits (stock take and stock take audits, diet sheet audits, equipment audits, etc.)	57	38	5	0	24
Stock takes of enteral feeds and supplements*	62	33	0	0	57
Develop and review departmental plans (Strategic, Business and Operational)	67	29	0	5	16
Asset management and physical resource management (including dietetic related equipment monitoring, repair, and monitoring) *	43	57	0	0	24

*excluded from the final list due to duplication; †excluded due to low agreement

"Food service managers at provincial/national office should audit food services. Central hospitals have foodservice managers that do not report to dietitians."

"Qualified foodservice managers need to be employed at this level as per NDOH FSM (National Department of Health Food Service Management) policy. Technical support meetings need to be held between dietetics and foodservice units to address challenges."

"All institutions have FSU (Food Service Unit) managers (some also at AD level). It is their own responsibility to monitor and audit their service.

Dietitians can be consulted regarding special diet requirements."

One additional service activity, "outreach activities-community or lower-level activities" did not reach the consensus threshold of 70% (Table 3). Participants who agreed with this activity stated:

"Lower-level hospitals do not have dietitians and usually only have community service dietitians and usually require some support and supervision."
"Dietitians need to visit clinics/ schools where no dietitians are allocated."
"Outreach to lower-level hospitals and communities helps in supporting hospitals with guidelines on management of patients and when to refer patients to tertiary institution or next level of care. Also, to assist with resources that they might lack."
"Outreach should be done with regards to training and workgroups and journal clubs. At a tertiary hospital there is a lot of expertise that can be shared through outreach."

Participants who disagreed with this activity stated the following:

"Dietitians at tertiary hospitals should prioritize tertiary services, while the dietitians employed at district level should be responsible for outreach activities and other primary health services."
"If the staff is adequate at a facility, then it is possible to do outreach. Outreach makes no sense if existing dietitians are not able to cover the entire service required at their own facility."
"We do not do outreach to community as we have community-based dietitians working in the clinics."

All the agreed upon workload components and activity standards were reviewed in round three. A total of 71 workload components (17 health, 25 support, and 29 additional service activities) were proposed including those newly added by participants in the first two rounds. Following the consensus process, a total of 66 workload components (17 health, 23 support and 26 additional service activities) met the agreement threshold of 70% or more. This resulted in a 92% agreement rating on all proposed and newly added workload components.

The tables were further reviewed and verified by all the researchers to remove any duplicate activities, resulting in the final set of workload components and activity standards for dietitians at central and tertiary public hospitals. The final lists included several administrative activities performed by dietitians that may be performed by support staff. Such activities were also removed to allow for a more accurate representation of the activities that dietitians should be performing at central and tertiary public hospitals. The reviewed final lists following the removal of duplicate and certain administrative activities resulted in a total of 45 workload components (15 health, 15 support and 15 additional service activities) together with aligned activity standards (Tables 4, 5, 6).

Table 4 Final health service activities and related activity standards

Health service activities (≥ 70% agreement)	Activity standard based on the median (minutes per patient)
Ward rounds (individual and multidisciplinary)	10
Patient screening	5
In patient consultation and treatment (new)	30
In patient nutritional assessment (ABCDE) and diagnosis (new)	15
In patient calculation of nutritional requirements and development of nutrition intervention plans (new)	15
In patient nutrition support and dietary counselling (new)	30
In patient consultation and treatment (FU)	15
In patient referral, communication with the multidisciplinary team and related activities	10
Outpatient consultation and treatment (new)	45
Outpatient nutritional assessment (ABCDE) and diagnosis (new)	15
Outpatient nutritional plan and intervention including dietary counselling (new)	30
Outpatient consultation and treatment (FU)	30
Outpatient specialist clinics	45
Report writing and patient notes	15
Referral process between health facilities	10

Table 5 Final support service activities and related activity standards

Support activities (≥ 70% agreement)	Activity standard based on the median (hours per year)
Food service management (developing and updating of cycle menus, therapeutic diets and related diet sheets)	24
Development and review of policies, protocols, and guidelines (including related IEC materials)	36
Dietetics departmental meetings	38
Hospital committee/internal stakeholder meetings	44
Meetings with industry representatives and other external stakeholders	18
Own performance development and management system (PMDS) reporting	8
Continued professional development (CPD) activities	24
Participation in journal reviews and working groups	38
In-service training to the multidisciplinary team (nurses, doctors, etc.)	12
In-service training to the food service team	8
Student mentoring, evaluation and reporting (including meeting with universities and accreditation of facilities)	90
Attend training (generic)	18
Recordkeeping, statistics & report writing	48
Peer reviews and clinical audits	24
Outpatient health awareness events/campaigns/open days (planning and participation)	20

Table 6 Final additional service activities and related activity standards

Additional activities (≥ 70% agreement)	Activity standard based on the median (hours per year)
Managerial duties (risk management, financial management (budgeting and procurement), asset management, planning of duty rosters)	24
Audits (stock take and stock take audits, diet sheet audits, equipment audits, etc.)	24
Develop and review departmental plans (strategic, business and operational)	16
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	24
Report writing, validations and presentations	36
Human resource management (recruitment, selection of new staff, grievances and disciplinary processes, HPCSA registration and compliance, attendance and leave register)	48
Orientation of new staff, training, support and supervision of lower-level staff and community service dietitians	191
Performance development and management system (PMDS)	20
Participation in research activities	24
National core standards/quality improvement programs (QIP)-develop plans, evaluation, and reports	19
Planning and coordination of departmental meetings	36
District, provincial integrated nutrition program (INP) and allied meetings	24
Mother baby friendly initiative (MBFI) mentor/committee participation and activities	24
Education, training and supervision of foodservice/diet kitchen staff/milk kitchen/tube feed personnel	53

Discussion

This study highlighted the strengths of using the online Delphi method together with a cadre-based expert working group to determine consensus on workload components and activity standards for dietitians in South Africa [6]. Using the online Delphi method, we were able to successfully obtain a 92% consensus rating on proposed workload components and activity standards. Only 8% of the activities fell short of the agreement threshold. We used JDs as the source document to provide a baseline while the iterative process created the ideal platform for further investigation, discussion, and agreement on the workload components and activity standards.

The online Delphi method allowed us to gather expert opinions and circumvented the need to meet physically while providing "real time and real-world data" in a short space of time [18, 19]. Compared to other WISN studies, the online approach limited the

need for additional logistical arrangements, costs, and the need to remove health professionals from their work setting while allowing for a nationally representative sample [8, 10]. We ensured content validity by exploring the opinions of head dietitians with both an interest and expert knowledge on the workload components of dietitians [17, 18]. Quasi-anonymity ensured that the responses and opinions of participants remained strictly confidential and allowed participants the opportunity to share their views and opinions freely, limiting the risk of peer pressure and bias [16–22]. The concurrent rounds allowed for adequate consultation with experts to reach consensus on baseline activities. We also obtained a 100% response rate which added to the rigor and validity of our findings [18].

Two activities did not garner support from all participants. For the support services activity, "monitor and audit foodservices-in-household", participants provided contrasting views. Some participants felt that dietitians should monitor and audit foodservices, while other participants felt that monitoring food services was the responsibility of the food services manager. In terms of additional activities, some participants felt that outreach activities should fall within the workload activities of dietitians, while other participants mentioned that outreach would only be possible if the dietitians were able to fulfill their existing duties. Dietitians at district hospitals might also be better suited to providing outreach services. For these activities, a large proportion of the group indicated a neutral response for both activities and making it difficult to delineate clear agreement or disagreement. Although these activities did not meet the 70% consensus threshold, we recommend that individual hospitals explore these two activities to determine their practical use.

Limitations

This study had several limitations. The online platform introduced challenges with internet connectivity and limited access to computers for some participants; however, this was managed by conducting follow-up telephonic interviews. Different hospitals also provided different JDs, with some JDs providing detailed information on actual activities while others were very vague and only included broader key performance areas. We had to rely on the expertise of the researcher as a dietitian to extract activities as guided by the WISN definitions for the three categories of workload components [6]. These workload components thus served as a predefined set of activities for further exploration by the expert group [19], [23].

Conclusion

The Delphi technique was a suitable method for obtaining consensus on WISN workload components and activity standards for dietitians at South African central and tertiary public hospitals. Although the JDs of dietitians were not standardized, we were able to identify a standard set of workload components and activity standards, which may allow for the possible standardization of JDs, providing a better representation of the actual activities performed by dietitians. The findings of this study can serve as a reference in future WISN studies that aim to assess the staffing requirements of dietitians at central and tertiary level public hospitals in South Africa.

Abbreviations

ASD	Assistant Director
CD	Chief Director
DD	Deputy Director
HPCSA	Health Professions Council of South Africa
JDs	Job descriptions
PD	Production dietitian
SPSS	Statistical Package of the Social Sciences
WHO	World Health Organization
WISN	Workload Indicators for Staffing Need

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Author contributions

VNN, HL, and JM were responsible for the conceptualization and design of the study. HL and JM supervised data collection and analyses. VNN, HL and JM contributed to the drafting, writing, and editing of this paper. KN was responsible for the critical review of the draft manuscript. All authors read, reviewed and approved the article.

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Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to these being the property of the South African Department of Health but are available from VNN on reasonable request and with permission and approval from the South African Department of Health and its corresponding research committees at provincial and hospital level.

Declarations

Ethics approval and consent to participate

Ethics approval was obtained through the Research Ethics Committee, Faculty of Health Sciences at the University of Pretoria (Ethics Number: 97/2021). The study was registered and approved for data collection via the National Health Research Database. Study participants were provided with a formal letter detailing the study and invited to participate in the study. All participants signed an informed consent form prior to the commencement of study. Consent to participate was completely voluntary. Only consenting individuals were included in the study.

Consent for publication

Consent for publication was obtained through the South African National Health Research Database, corresponding provincial research committees and hospital research committees where applicable.

Competing interests
The authors declare that they have no competing interests. VNN is currently employed by the South African Department of Health.

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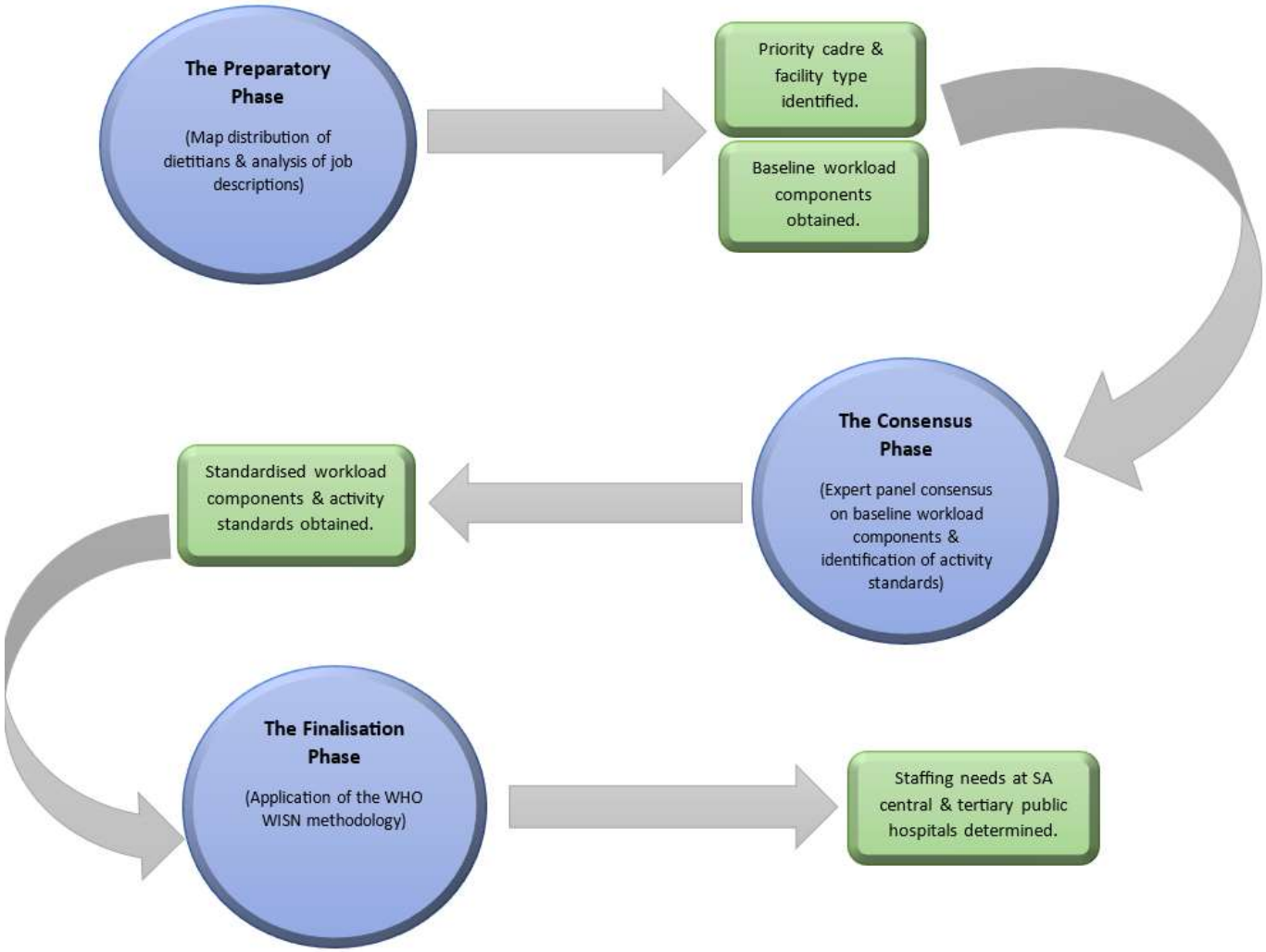

Figure 4. Finalisation Phase: Application of the Workload Indicators of Staffing Need: A Case Study of the Dietetic Workforce at South African Central and Tertiary Public Hospitals

CHAPTER FOUR: UNPUBLISHED MANUSCRIPT ONE

Even though baseline data was obtained on the number of dietitians during the preparatory phase, it was yet to be determined whether these numbers were adequate to meet service demands. As a result, this chapter focusses on the first objective of the finalisation phase as highlighted in the illustration below. A case study was undertaken at 21 central and tertiary public hospitals based on the data provided in the consensus phase. This case study utilised the WHO WISN software to determine the WISN calculated requirement for dietitians. The result of this paper provides a comparison between the baseline data and the actual required number of staff, giving an indication of the adequacy of the present staff complement. The paper also reveals additional challenges experienced and provides suitable recommendations for the future forecasting of dietitians.

This Chapter has been formatted as per the submission guidelines for the BMC: Human Resources for Health Journal. The manuscript has been submitted to the journal with the following reference number: HRHE-D-23-00110. Proof of submission is provided in Appendix 11.

Title: Application of the workload indicators of staffing need: A case study of the dietetic workforce at South African central and tertiary public hospitals

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Abstract

Background: South Africa`s double burden of malnutrition (under-and over-nutrition) stresses the need for the national prioritisation of nutrition services in the country. The registered dietetic professional plays a significant role in the provision of appropriate and quality nutrition services thereby forming a vital part of the health care team. Hence, this study applies the evidence-based World Health Organisation (WHO) Workload Indicators of Staffing Need (WISN) in a case study to determine the dietetic workforce needs at central and tertiary public hospitals in South Africa.

Methods: Head dietitians at 21 of 22 central and tertiary public hospitals participated in an online Delphi survey. Data collection was aligned to the eight step WISN methodology. Data were analysed using the WHO WISN software. Dietetic staffing needs were determined based on the differences between current and required numbers of dietitians and the WISN ratio used to measure the workload pressures of dietitians.

Results: Findings revealed that South African central and tertiary public hospital dietitians experience high workload pressures due to extreme understaffing. At least half of the hospitals (n=10) had a WISN ratio of less than 0.5 indicating they met less than 50% of the

staff requirements and thus experienced a high workload pressure. When administrative support activities linked to dietetic services are adjusted for, the staff requirements of dietitians can be reduced. Without adjusting for the administrative activities, none of the sampled hospitals met the total WISN calculated requirements. The lack of managerial posts and support staff, increased work pressures leading to the need for overtime in some instances.

Conclusion: WISN is a beneficial tool in not only determining the needs of the dietetic workforce but in helping reveal other daily challenges. Application of WISN can be advantageous in the future planning of the profession allowing for improved nutrition outcomes in the country.

Keywords: Dietitian, Hospital, Staffing Need, South Africa, WISN, Workload Indicators

Background: South Africa`s need for alignment to the global agenda identifies the requirement for the availability and accessibility of competent and motivated health workers through equitable distribution to deliver quality services based on the socio-cultural needs of the population.[1] South Africa`s aptly named 2030 Human Resources for Health (HRH) Strategy: Investing in the Health Workforce for Universal Health Coverage (UHC) recognises the current inequalities that exist between professional skill mixes thus hindering health service delivery.[2, 3] More focus is often given to the staffing needs of doctors (8.6%) and nurses (56%) than other professionals that also play a significant role in the health care team.[2, 4-5] Recent global studies with a focus on other professionals indicate the need to ensure the right skill-mix to provide quality patient care.[4-6] South Africa`s diverse nation echoes a similar diversity in registered health care professionals through the Health Professions Council of South Africa (HPCSA), South African Nursing Council (SANC) and South African Pharmacy Council (SAPC).[7, 8] The SA HRH strategy strives towards the prioritisation of 22 key cadres including nurses (SANC) and pharmacists (SAPC) but does not include all health professional categories registered under HPCSA.[2] The dietetics cadre is registered with one of the 12 professional boards under the HPCSA but has not been included in the strategy. The slow rate of progress in meeting the 2025 global nutrition targets only intensifies the call for nutrition interventions.[9] In addition, South Africa`s double burden of malnutrition (under-and over-nutrition) further stresses the need for the national prioritisation of dietitians as part of an appropriate skill mix.[10-12] Hence, the determination of the current number and density of dietitians is a key first step in evidence based workforce planning at all levels of care.[2, 13]

The World Health Organisation (WHO) Workload Indicators of Staffing Need (WISN) is an evidence based planning tool used to determine the numbers of a particular type of health worker required to meet the workload demands of a given facility.[14, 15] It utilises available facility data to plan towards meeting staffing needs by considering health service packages, complexities of care and differences between health facilities.[13-16] The tool has proved

valuable in: analysing staffing workloads; calculating staffing needs; and planning future staffing requirements in the international hospital environment.[4, 14, 17-21] Hence, this study applies the evidence-based WHO WISN in a case study to determine the dietetic workforce needs at central and tertiary public hospitals in South Africa. The outcomes of this paper will serve useful in the future development of a staffing norm framework for dietitians.

Methods: Data collection for the study was completed in two phases. Phase one data were obtained from the nine provincial nutrition managers in the Department of Health, South Africa (SA). Data on the numbers, vacancies, and the job descriptions (JD) of dietitians working at central and tertiary hospitals were collected and analysed to provide the baseline data for phase two of the study. Study participants for phase two were a purposive sample of 21 dietetic department heads at SA central and tertiary public hospitals who consented to participate. An online survey was used to obtain: (i) consensus on workload components derived from the analysis of the JD, ii) data and consensus on activity standards (AS), (iii) Health service statistics and iv) information on support staff and overtime. The online survey comprised quantitative and qualitative questions. The focus of the online survey was to determine consensus on workload components and activity standards for dietitians at central and tertiary public hospitals.

Workload components are defined as the main work activities that take up most of a dietitians daily working time.[15] These are categorised into health service (performed by all dietitians supported by annual statistics), support service (performed by all dietitians without annual statistics) and additional service (performed by certain dietitians without annual statistics) activities.[15] Activity standards are defined as the time necessary for a well trained, skilled and motivated dietitian to perform workload components to professional standards.[15] An online delphi survey with three rounds of iterations was used to obtain consensus [22] on workload components and activity standards and all 21 dietitians participated. Standardised lists of workload components and activity standards were obtained following analysis of each round.

The WISN methodology informed the generation of the required dietetic staffing needs.[15] Results were analysed and interpreted to determine the difference between current and required staffing levels (over or understaffing) and the current workload pressures of dietitians based on the WISN ratio.[15]

Results:

Participant demographics

Participants' demographics based on rank, years of experience and age are depicted in Figures 1, 2 and 3 respectively. In SA, dietetic ranks include: Production Dietitians (PD) at entry level, Chief Dietitians (CD), Assistant Directors (ASD) and Deputy Directors (DD) as guided by the Department of Public Service and Administration (DPSA). Figure 1 shows that most hospitals (10) had CD followed by ASD (8) while the remaining three hospitals had a DD (1), Acting ASD (1) and PD (1) serving as managers.

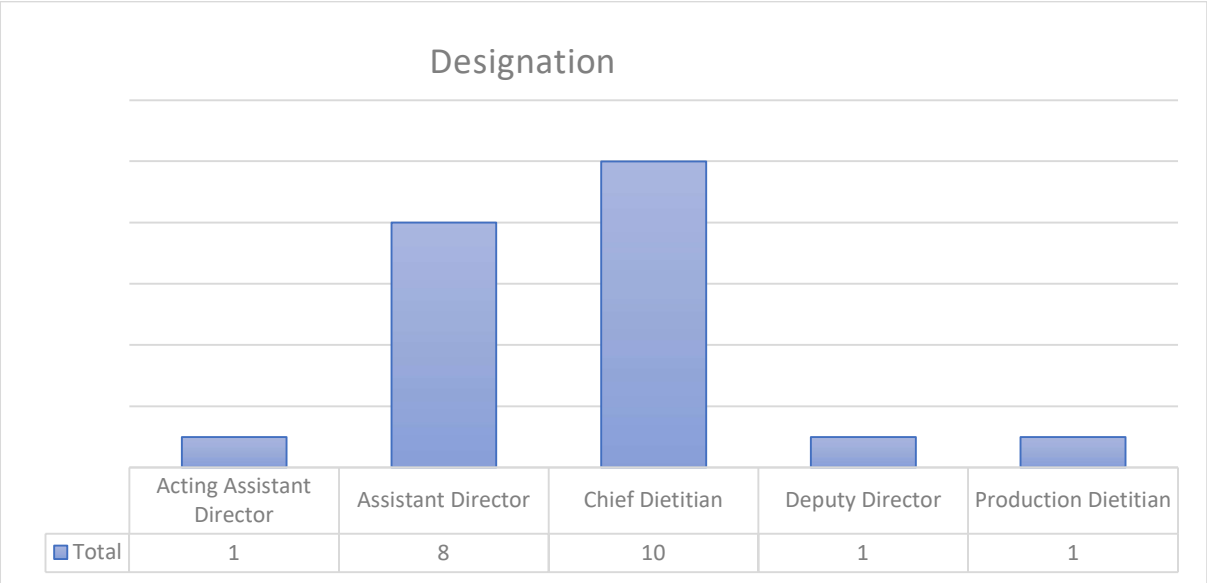

Figure 1. Designation of head dietitians at 21 central and tertiary hospitals in South Africa

Figure 2 illustrates that most managers (n= 11) had at least 11-20 years of experience', followed by those with 6-10 years (n=6) and those with 21-30 years and over 30 years in the field having equal numbers (n=4) of years of experience. In terms of age ranges, Figure 3 shows that all managers were over 30 years of age with most falling into the age ranges of between 30 -39 (n=7) and 40-49 (n=7) years.

Figure 2. Years of experience of head dietitians at 21 central and tertiary hospitals in South Africa

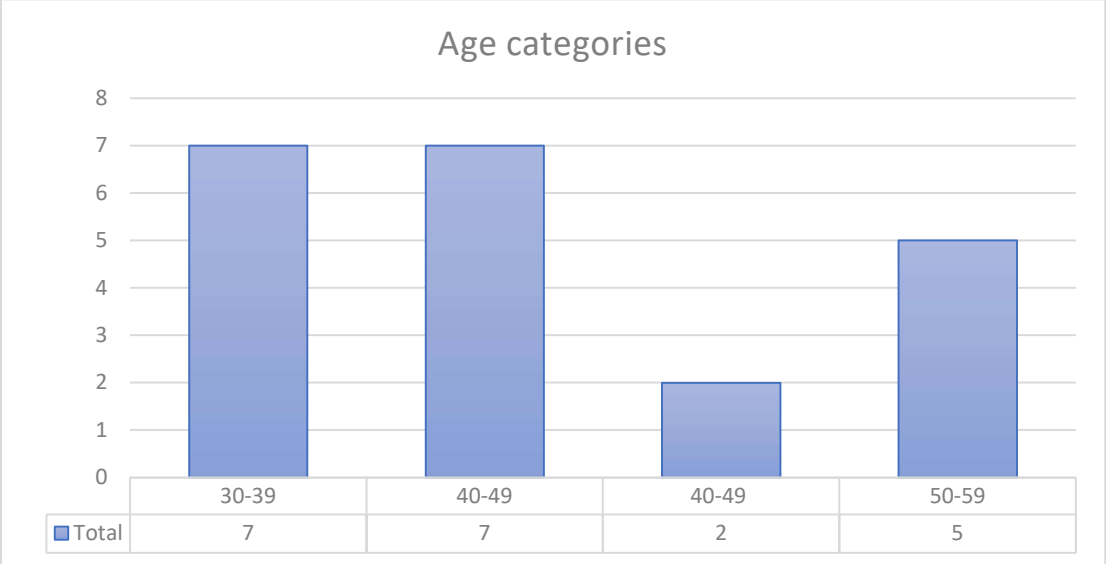

Figure 3. Age categories of head dietitians at 21 central and tertiary hospitals in South Africa

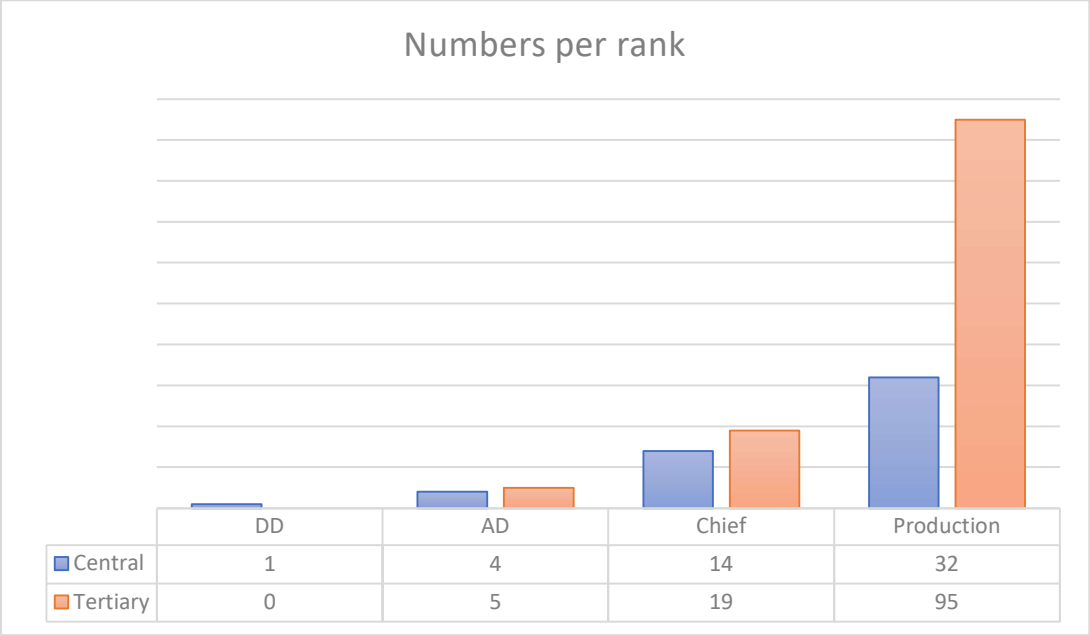

Figure 4. Number of permanent dietitians per rank at South African central and tertiary public hospitals

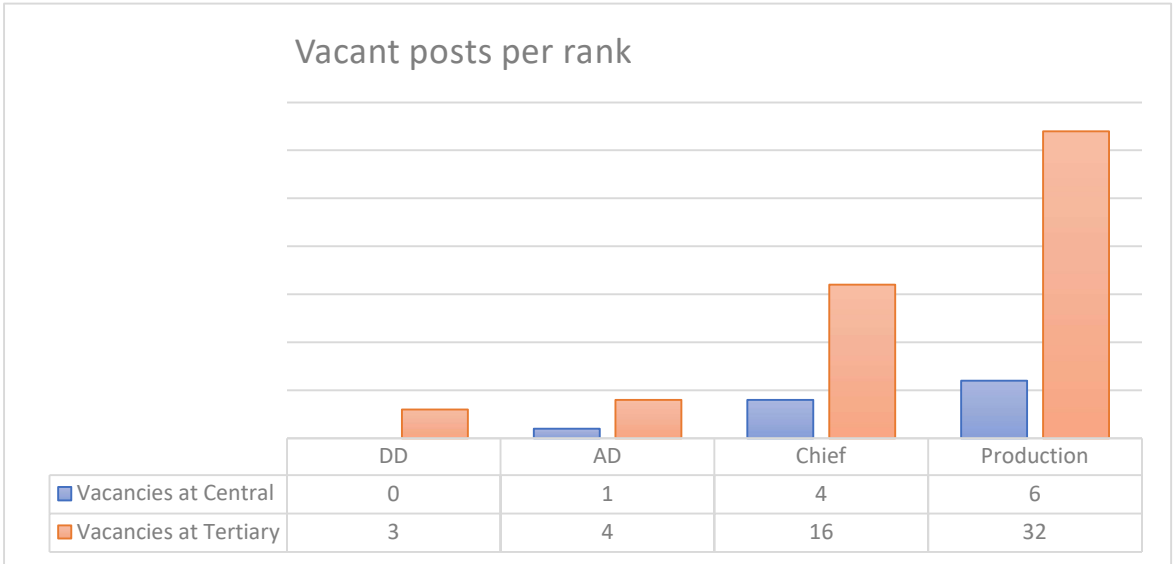

Figure 5. Number of vacant posts per rank at South African central and tertiary public hospitals

Figure 4 indicates the proportion of dietitians per rank at South Africa central and tertiary public hospitals. Out of a total of 51 dietitians at central hospitals majority were PD (n=32) followed

by CD (n=14) and DD (n=1). Out of a total of 119 dietitians at tertiary hospitals, majority were PD (n=95) followed by CD (n=19). No dietitian occupied the DD post. Figure 5 depicts the number of vacant posts available at central and tertiary public hospitals. In the six central hospitals there were vacant posts for PD (n=6), CD (n=4) and AD (n=1). In the 15 tertiary hospitals there were vacant posts for all the ranks with the majority being for PD (n=32) followed by CD (n=16).

Workload components and activity standards

Three rounds of delphi were conducted and all 21 dietitians participated. As seen in Tables 1, 2 and 3 the final consensus list contained: 15 health service ; 15 support service and 14 additional service activities following the survey. There was 92% consensus on all items presented to participants including the additional proposed items.

Table 1. Health service activities and related activity standards based on consensus

Health service activities	Activity standard (minutes per patient)
Ward rounds (individual and multidisciplinary)	10
Patient screening	5
In patient consultation and treatment (new)	30
In patient nutritional assessment (ABCDE) & diagnosis (new)	15
In patient calculation of nutritional requirements & development of nutrition intervention plans (new)	15
In patient nutrition support and dietary counselling (new)	30
In patient consultation and treatment (FU)	15
In patient referral, communication with the multidisciplinary team and related activities	10
Outpatient consultation and treatment (new)	45
Outpatient nutritional assessment (ABCDE) & diagnosis (new)	15
Outpatient nutritional plan and intervention including dietary counselling (new)	30
Outpatient consultation and treatment (FU)	30
Outpatient specialist clinics	45
Report writing and patient notes	15
Referral process between health facilities	10

Table 2. Support service activities and related activity standards based on consensus

Support activities	Activity standard (Hours per year)
Food service management (developing and updating of cycle menus, therapeutic diets & related diet sheets)	24
Development and review of policies, protocols, and guidelines (including related IEC materials)	36
Dietetics departmental meetings	38
Hospital committee/ internal stakeholder meetings	44
Meetings with industry representatives and other external stakeholders	18
Own performance development and management system (PMDS) reporting	8
Continued professional development (CPD) activities	24
Participation in journal reviews and working groups	38
In-service training to the multidisciplinary team (nurses, doctors etc)	12
In-service training to the food service team	8
Student mentoring, evaluation & reporting (Including meeting with universities and accreditation of facilities)	90
Attend training (generic)	18
Recordkeeping, statistics & report writing	48
Peer reviews and clinical audits	24
Outpatient health awareness events/campaigns/open days (planning and participation)	20

Table 3. Additional/individual service activities and related activity standards based on consensus

Additional/Individual activities	Activity standard (Hours per year)
Managerial duties (risk management, financial management (budgeting and procurement), asset management, planning of duty rosters)	24
Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	24
Develop and review departmental plans (strategic, business, and operational)	16
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	24
Report writing, validations and presentations	36
Human resource management (recruitment, selection of new staff, grievances, and disciplinary processes, HPCSA registration & compliance, attendance and leave register)	48
Orientation of new staff, training, support and supervision of lower-level staff and community service dietitians	191
Performance development and management system (PMDS)	20
Participation in research activities	24
National core standards/quality improvement programs (QIP)-develop plans, evaluation, and reports	19
Planning and coordination of departmental meetings	36
District, provincial integrated nutrition program (INP) and allied meetings	24
Mother Baby Friendly Initiative (MBFI) mentor/committee participation and activities	24
Education, training, and supervision of foodservice/diet kitchen staff/milk kitchen/tube feed personnel	53

Health service statistics

Health service statistics were obtained from all 21 hospitals for the period January 2021 to December 2021, only 8 of the 21 hospitals provided complete lists (Figure 6). Reasons for incomplete statistics related to poor data recording or no data being collected for certain health service activities. As a result, all health service activites without supporting statistics were omitted from the final workload calculations for respective hospitals. Final workload calculations for these hospitals will reflect as an underestimation of their actual staffing requirements.[15, 17]

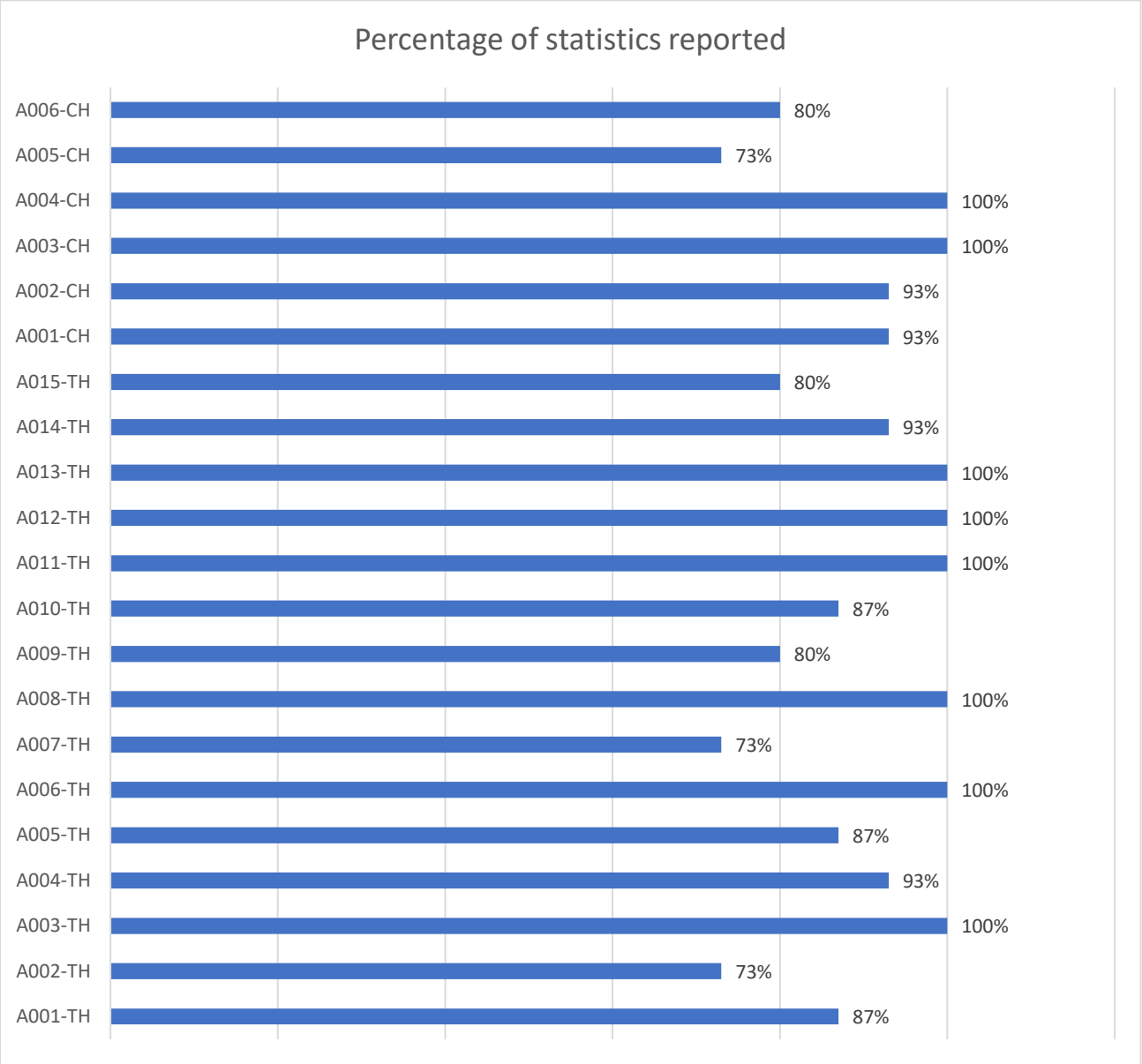

Figure 6. Percentage of health service statistics reported per hospital

Availability of support staff

Table 4. Administrative activities currently performed by South African central and tertiary hospital dietitians

Administrative support or individual/additional service activities performed by dietitians	Activity standard (Hours per year)
Administrative functions related to ordering of specialised diets and therapeutic nutrition (PN & EN)	96
Monitor wastage and usage of PN and EN	48
Dietetic administrative functions (telephone calls, emails, booking appointments, photocopying etc)	190
The procurement process (ordering, receiving & monitoring of enteral feeds)	138
Stock take of enteral feeds and supplements	57

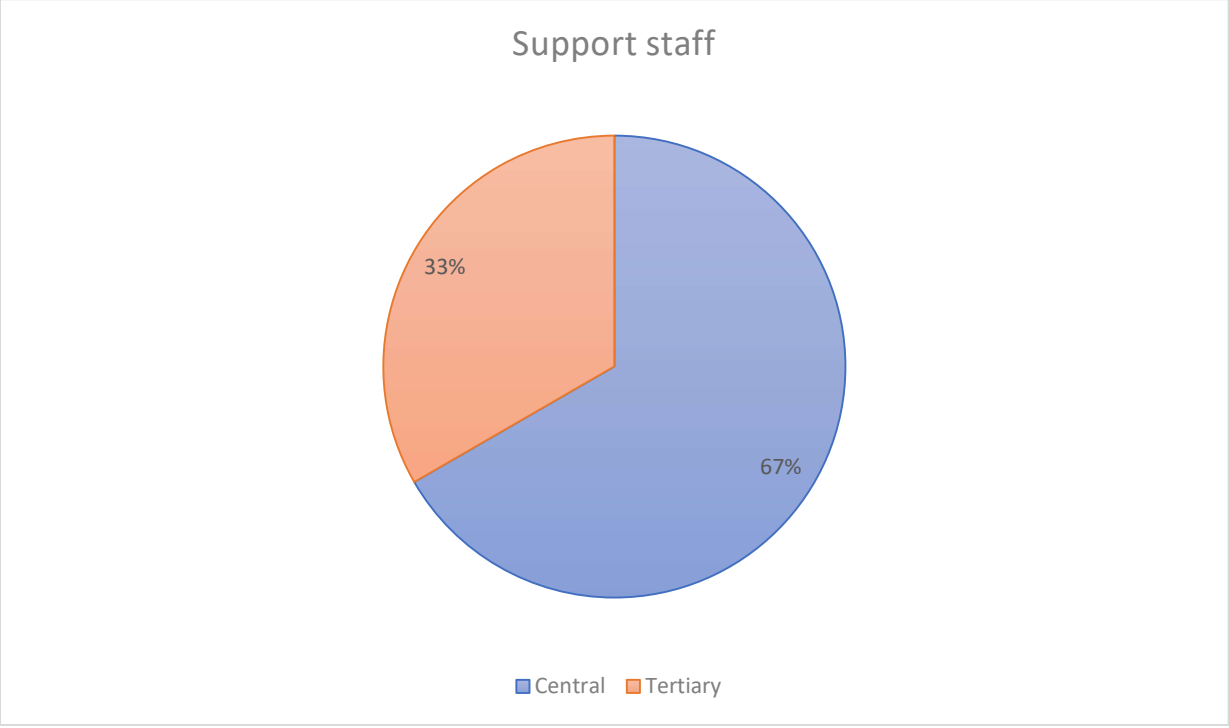

Figure 7. Percentage of hospitals with support staff services

The Delphi exercise revealed that dietitians performed several administrative tasks as part of support and additional service activities as presented in Table 4. At the time of data collection, 67% (5 out 15) tertiary hospitals and 33% (4 out of 6) central hospitals utilised the services of support staff (Figure 7). Results indicated that in most cases support staff included general

operators, auxillary workers and food service staff, however it was reported that this still did not meet the service demands.

Table 5. Proposed qualifications and activities for dietetic administration clerks

Proposed support staff categories	Proposed qualification	Proposed activities
Administration clerks:	• Matriculation certificate/Grade 10) and college certificate as applicable • Basic computer literacy • Office administration and management • Communication skills	• Reception functions: telephone assistance, booking, receiving, and assisting patients. • Stock monitoring: placing orders, receiving, and managing (nutritional feeds, stationary, cleaning materials, paper products, PPE) • Stock sheets (compiling and analysing) • Minute taking • Office organisation and filling system • Capturing and compiling of monthly/quarterly statistics and reporting • Assist in preparation for health awareness days (preparing material, photocopying, printing etc) • Issuing of nutrition related educational material. • Compile/generate meal stickers for special diets.

Table 6. Proposed qualifications and activities for dietetic store-room or general assistants

Proposed support staff categories	Proposed qualification	Proposed activities
Store-room assistants/packers: /General assistants/operator:	• Matriculation certificate/Grade 10) • Basic computer literacy • Communication and counselling skills (receive in service training on basic dietary counselling) • Basic knowledge on how to take anthropometric measures (weight, height, MUAC and calculate BMI)	• Stock control: receiving, packing, and issuing of stock. • Cleaning and stock rotation in storerooms • Basic dietary counselling • Assist with taking anthropometric measurements of patients. • Serve as a messenger/porter. • Accompany patients to next point of care. • Assisting dietitians in clinics • Labelling of Feeds • Issuing/collecting feeds and feeding pumps • Translation where required. • Reconstitution of powdered feeds in milk kitchen/feeds kitchen

Table 7. Proposed qualifications and activities for nutrition educators/advisors

Proposed support staff categories	Proposed qualification	Proposed activities
Nutrition educator/Nutrition advisor:	• Matriculation /Grade 10 with some level of nutrition certification/diploma in nutrition	• Screening of patients • Nutrition counselling: basic education and support (breast feeding support, healthy eating support, basic diabetes education etc) • Food demonstrations, education on food gardens, growth monitoring • Basic nutrition health talks and assistance with health awareness days. • Provision of nutrition products for nutrition therapeutic programmes or tube feed discharges • Running of the milk kitchen and basic education on reconstituting powdered/ tube feeds. • Assist with taking anthropometric measurements of patients. • Obtain basic information on a patient e.g., diet histories. • Ability to translate and interpret nutrition messages. • Perform simple mathematical calculations. • Monitor patients receiving correct feeds timeously including feed changes and charting. • Assist with home visits if necessary. • Stock control: receiving, packing and Issuing of Stock

Dietitians highlighted the need for three possible support staff categories with aligned activities that can prove useful in a dietetics unit (Tables 5, 6 and 7). These included administration clerks, store-room/general assistants and nutrition educators/advisors with a minimum of a matriculation or grade 10 certification. Several support and additional service activities performed by dietitians daily had been proposed for consideration as core activities that may be performed by support staff instead.

Overtime work

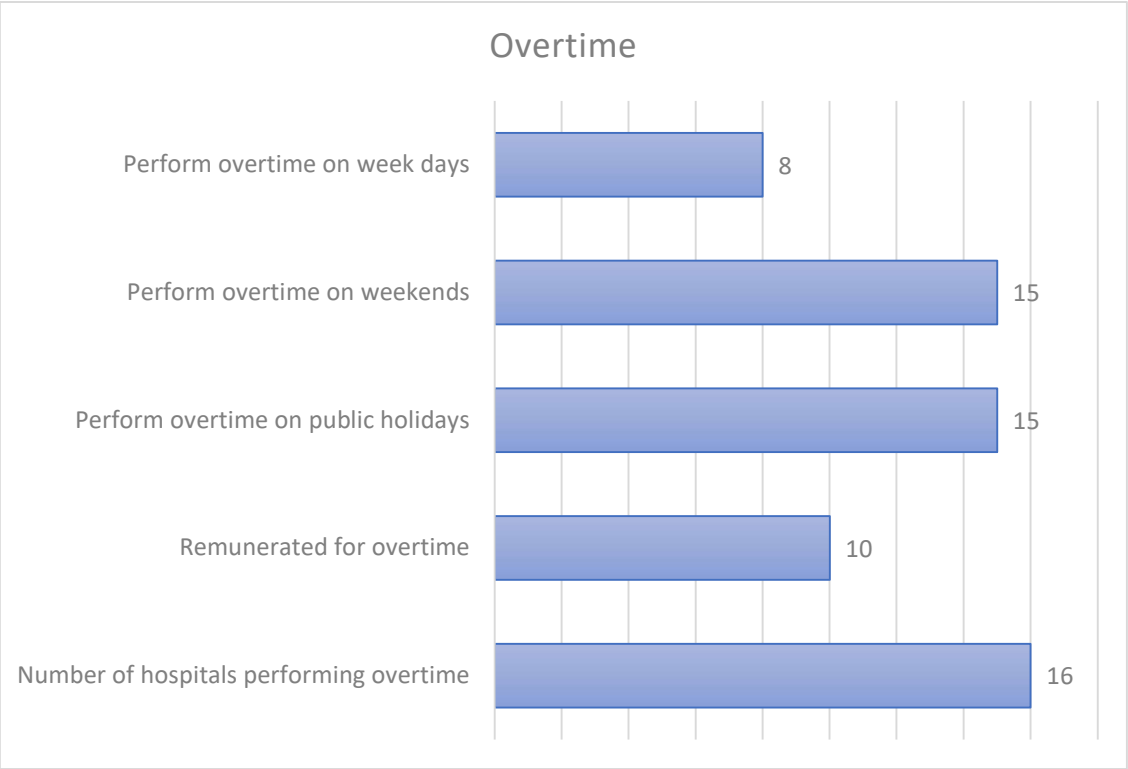

Figure 8. A representation of hospitals with dietitians performing overtime

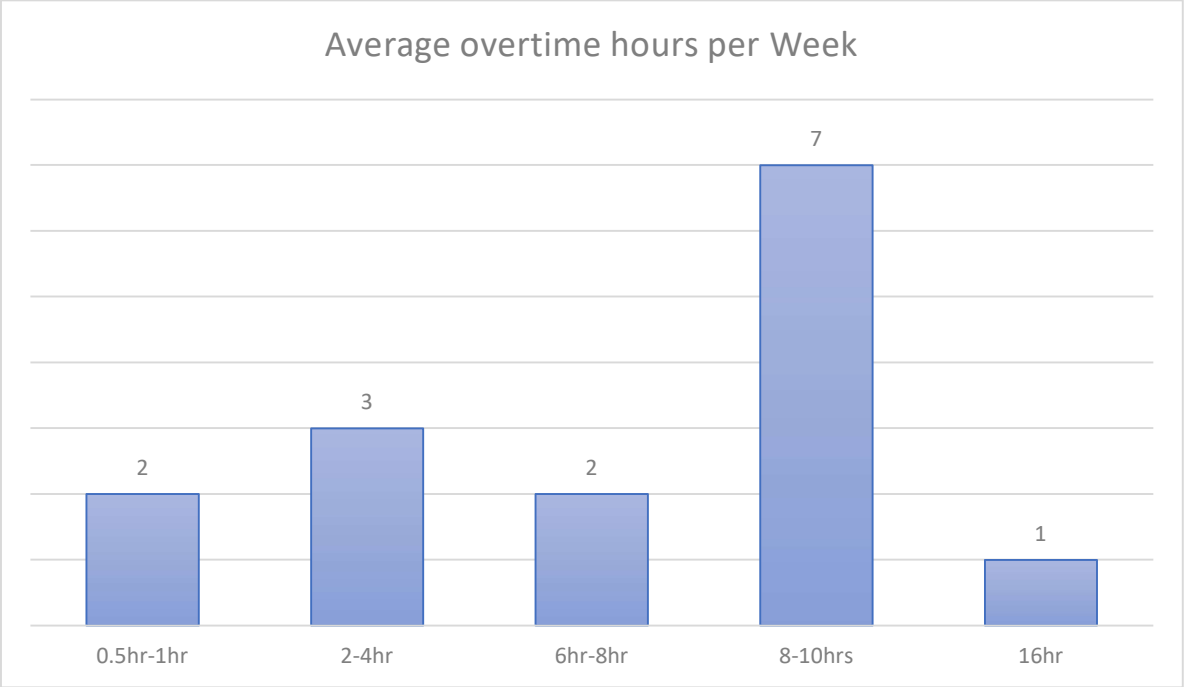

Figure 9. Average overtime hours performed by dietitians per week

Overtime was not considered when determining Available Working Time (AWT) for use as part of the study calculations. However, participant responses did indicate that most dietitians were performing overtime. Dietitians reponses indicated that 16 of 21 hospitals performed overtime with (15) performing overtime on weekends and public holidays, and (8) performing overtime on weekdays with most (7) performing between 8-10 hours of overtime weekly (Figure 8 and 9). Some indicated that they didn't officially perform overtime but were required to be `on call` during public holidays and weekends:

"Overtime vs. on call? We do not perform remunerated overtime, but we are on call afterhours, weekends, and public holidays. Most of the issues can be sorted out over the phone, but dietitians do go into the hospital when required. This is given as time back".

"We do not officially perform overtime, but we do accept telephonic consults over weekends and public holidays, in cases of emergency. I do however feel that there could be a place for overtime hours, depending on the situation and staff level, with compensation".

Seventeen of 21 participants indicated the neccessity to perform overtime on weekends and public holidays which included physical patient consultations*:*

"Dietitians are on call on public holidays and over weekends, without remuneration. Clinical instructions/prescriptions are given over the phone and can be misinterpreted by nursing staff, which can lead to litigations. By them being onsite, getting remunerated for the overtime, it'll eliminate all the risk. This is mainly for ICUs, high care units and other critical wards".

"The issue of overtime becomes so crucial especially because patients are fed throughout, so if a new patient is admitted on Friday after hours, and there is no overtime performance it means the patient will only be attended to or fed on Monday the following week. So, to avoid complications and reduce hospital stay most critical patients will need to be fed as soon as possible. If the patients' feeds need to be adjusted or changed due to the patients' conditions or complications, that needs to be done without any interruption".

Participants highlighted challenges on the topic of overtime despite providing such services:

"Dietitians used to perform overtime at our hospital. It was new management that felt that overtime is not necessary for Allied. Although I feel it's very much necessary since we have patients on TPN, enteral, neonates, ICU, burns that need continuous monitoring and feed adjustments".

"Overtime is a very controversial topic at our hospital. The Dietetic department is not currently approved for overtime as we have not applied in the past. However, we are starting the process as it is a necessity at our hospital".

Four of 21 respondents indicated that overtime for dietitians is not a neccessity:

"Prefer standby work than overtime work. Only for emergencies. Don't see it having an improved effect on service without multidisciplinary team also performing overtime work. Develop after hours protocol for nutritional management of patients".

"We are available 24 hours on our speed dials (and assist the staff over the phone), but we don't work official overtime hours at the hospital itself. If it does happen that a dietitian needs to come in for example over weekends (which does not happen often at all), she can just record the time and arrange with her supervisor to take the time off as required. Most of the time, we can assist the wards over the phone".

Dietitians are often forced to perform overtime due to extreme understaffing and workload pressures:

"Current workload does not always permit one to wrap-up after 8.5hrs, no matter how much time-management is practiced".

"Remuneration occurs on weekends and public holidays for being on standby. As Acting unit manager, not all things can be done in office hours. If there are deadlines, you perform to meet it. I will e mail work home and finish all that needs to be done. No remuneration".

"Overtime during the week is spent to fill in the gaps created with extreme staff shortages as a result of the persistent moratorium on the filling of posts. Lunches are often sacrificed to get through the clinical duties for the day. Voluntary on call facility is provided for every weekend and public holiday in order to ensure continuity of nutrition services for when the dietitian is away. No remuneration is provided for the overtime performed".

Majority of dietitians see the need for dietetic services on weekends and public holidays to allow for service continuity (Figure 10).

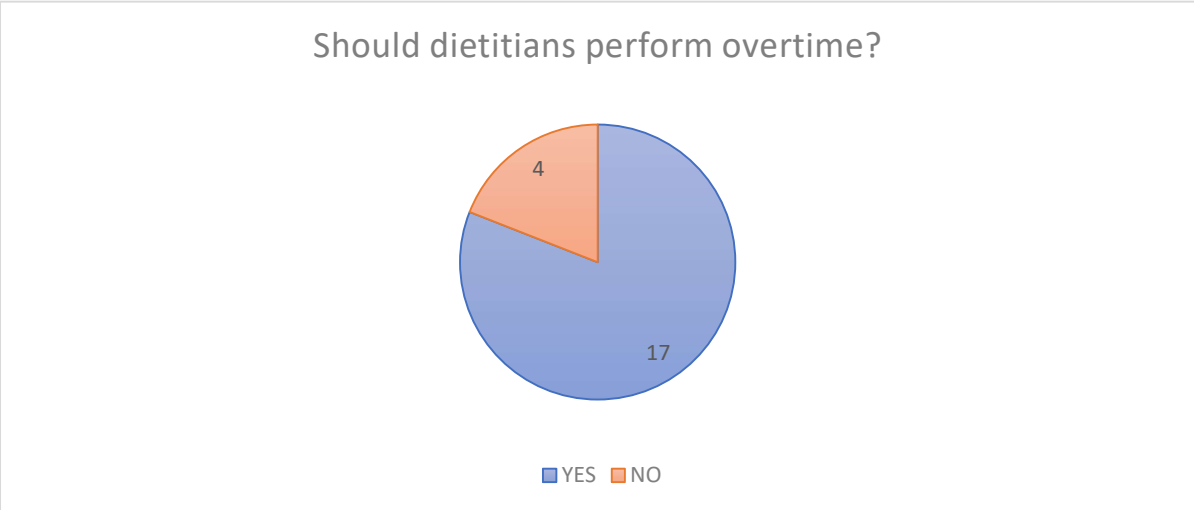

Figure 10. Dietitians views on performing overtime

WISN based scenarios for dietetic staffing requirements

Table 8. An overview of the WISN required number of dietitians at South African central and tertiary hospitals

Name of hospital	Current dietitians (February to April 2022)	Scenario 1: WISN requirement to support ONLY health service activities	Scenario 2: Total WISN requirements WITH assistance of support staff	Scenario 3: Total WISN requirement WITHOUT assistance of support staff
A001-TH	17	26	38	67
A002-TH	10	15	23	40
A003-TH	5	10	15	26
A004-TH	4	9	14	24
A005-TH	11	10	16	27
A006-TH	8	23	34	59
A007-TH	9	11	19	33
A008-TH	11	23	35	36
A009-TH	6	4	6	10
A010-TH	5	21	31	54
A011-TH	7	30	45	76
A012-TH	7	19	27	49
A013-TH	7	16	24	43
A014-TH	8	6	10	18
A015-TH	6	8	12	21
A001-CH	4	11	16	28
A002-CH	13	24	37	64
A003-CH	6	14	21	36
A004-CH	9	26	38	67
A005-CH	9	26	39	68
A006-CH	11	12	19	32

WISN requirements based on three sets of workload components (health, support and additional) was used to account for all activities that dietitians perform daily for the provision of nutrition services. Table 8 provides an overview of the number of dietitians and the requirements based on three proposed scenarios. Whereby: Scenario 1) WISN requirements to meet ONLY health service activities; Scenario 2) Total WISN requirements with the assistance of support staff and Scenario 3) Total WISN requirements without the assistance of support staff. Scenario 1 was intended to provide an insight of the hospitals currently struggling to meet basic health service activities while Scenarios 2 and 3 provide a comparison of the required number of dietitians based on the availability or non-availability of support staff.

The availability and non-availability of support staff was aligned to the exclusion and inclusion of non-clinical administrative activities (Table 4) in WISN calculations respectively. It is clear that in all 21 hospitals there is a lesser requirement for dietitians if support staff are available to cover certain additional activities (Table 8).

When looking at Scenario 1, Tables 9 illustrates the difference between current and required staffing needs showing levels of under or overstaffing. It is interesting to observe that workloads can vary between hospitals at the same level of care.[23] Results show that only three (14%) hospitals (A005-TH, A009-TH and A014-TH) reported sufficient numbers of dietitians to cover basic health service activities (Table 9). Table 9 also indicates that A011-TH has the highest deficit in staff (n=23), followed by A004-CH and A005-CH (n=17) while hospital A006-CH (n=1) has the least staff deficit followed by A015-TH (n=2).

Whilst staffing differences are important it is also neccesary to relate these differences to actual workload pressure through use of the WISN ratio.[15] WISN Ratios are calculated by dividing the current number of dietitians by the required number of dietitians. A WISN ratio equal to 1 indicates sufficient dietitians. A ratio of more than 1 indicates overstaffing. Whilst a WISN ratio of less than 1 indicates understaffing and high workload pressures.[15] Table 9 illustrates that about a half of the hospitals (n=10) had a WISN ratio of less than 0.5 indicating they met less than 50% of the staff requirements and thus experienced a high workload pressure. Two tertiary hospitals (A011-TH and A010-TH) have the highest workload pressures in trying to meet basic health service activities indicated by very low WISN ratios of 0.23 and 0.24 respectively.

Table 9. Scenario 1: staffing differences and workload pressures based on health service activities

Hospital	Permanently employed dietitians (February to April 2022)	Calculated WISN requirement for ONLY health service activities	Difference	WISN ratio
A001-TH	17	26	-9	0.67
A002-TH	10	15	-5	0.65
A003-TH	5	10	-5	0.49
A004-TH	4	9	-5	0.44
A005-TH	11	10	1	1.11
A006-TH	8	23	-15	0.35
A007-TH	9	11	-2	0.79
A008-TH	11	23	-12	0.47
A009-TH	6	4	2	1.63
A010-TH	5	21	-16	0.24
A011-TH	7	30	-23	0.23
A012-TH	7	19	-12	0.37
A013-TH	7	16	-9	0.42
A014-TH	8	6	2	1.23
A015-TH	6	8	-2	0.75
A001-CH	4	11	-7	0.37
A002-CH	13	24	-11	0.53
A003-CH	6	14	-8	0.44
A004-CH	9	26	-17	0.35
A005-CH	9	26	-17	0.34
A006-CH	11	12	-1	0.95

Table 10. Scenario 2: staffing differences and workload pressures based on the inclusion of support staff

Hospital	Permanently employed dietitians (February to April 2022)	Calculated WISN requirement for health, support, and individual activities WITH assistance of support staff	Difference	WISN ratio
A001-TH	17	38	-21	0.45
A002-TH	10	23	-13	0.44
A003-TH	5	15	-5	0.34
A004-TH	4	14	-10	0.29
A005-TH	11	16	-5	0.69
A006-TH	8	34	-26	0.24
A007-TH	9	19	-10	0.47
A008-TH	11	35	-24	0.32
A009-TH	6	6	0	1.03
A010-TH	5	31	-26	0.16
A011-TH	7	45	-38	0.16
A012-TH	7	27	-20	0.18
A013-TH	7	24	-17	0.29
A014-TH	8	10	-2	0.78
A015-TH	6	12	-6	0.50
A001-CH	4	16	-12	0.25
A002-CH	13	37	-24	0.36
A003-CH	6	21	-15	0.29
A004-CH	9	38	-29	0.24
A005-CH	9	39	-30	0.23
A006-CH	11	19	-8	0.59

When looking at Scenario 2 (Table 10), only one (5%) hospital (A009-TH) served by six dietitians met the staffing need. However, in the absence of support staff (Scenario 3) this hospital (A009-TH) would need an additional four dietitians to fulfill the WISN requirement. Results indicate A011-TH as the most understaffed hospital based on all three scenarios (Tables 9, 10 and 11). Although, A005-TH, A009-TH and A014-TH hospitals show adequate or overstaffing, for scenario one, all three hospitals still show understaffing with the absence of support staff (scenario 3). Workload pressures are seen to increase relative to the required needs for Scenarios 2 and 3 (Tables 10 and 11).

Table 11. Scenario 3: staffing differences and workload pressures based on the exclusion of support staff

Hospital	Permanently employed dietitians (February to April 2022)	Calculated WISN requirement for health, support, and individual activities WITHOUT assistance of Support Staff	Difference	WISN ratio
A001-TH	17	67	-50	0.25
A002-TH	10	40	-30	0.25
A003-TH	5	26	-21	0.19
A004-TH	4	24	-20	0.17
A005-TH	11	27	-16	0.41
A006-TH	8	59	-51	0.13
A007-TH	9	33	-24	0.27
A008-TH	11	36	-25	0.18
A009-TH	6	10	-4	0.60
A010-TH	5	54	-49	0.09
A011-TH	7	76	-69	0.09
A012-TH	7	49	-42	0.10
A013-TH	7	43	-36	0.16
A014-TH	8	18	-10	0.46
A015-TH	6	21	-15	0.28
A001-CH	4	28	-24	0.14
A002-CH	13	64	-51	0.20
A003-CH	6	36	-30	0.17
A004-CH	9	67	-58	0.13
A005-CH	9	68	-59	0.13
A006-CH	11	32	-21	0.35

Discussion

This case study was beneficial in providing an indication of the levels of understaffing at dietetic units in South African central and tertiary public hospitals.[16] In addition, the study process has also uncovered critical challenges and dietitian perspectives related to staffing. The calculated WISN requirements have shown that 86% of hospitals are not meeting their dietetic staffing needs for basic health service activities (Scenario 1), whilst 95% of hospitals are unable to meet their full WISN staffing requirements even with the assistance of support staff (Scenario 2). Finally, 100% of hospitals are not meeting the WISN requirement for dietetic staff in the absence of support staff (Scenario 3). These levels of understaffing also

correspond with a similar trend in workload pressures between the three scenarios. The application of WISN in other countries have also assisted in showing levels of understaffing for several cadres within the health care setting. [16, 21, 23-25]

The Delphi process on finding agreement on the ideal workload components indicated that dietitians are performing unnecessary administrative activities due to a lack of support staff. This study has shown that proper task shifting of non-clinical activities (Table 4) to lower level support staff can lessen the need for more dietitians than is actually required due to inequalities in the right skill mixes (Scenario 2 and 3).[26] Such activities often lead to dietitians spending more time on non-dietetic related activities which can compromise direct patient care. Table 4 highlights critical administrative activities to support the smooth running of dietetic departments. For as long as there remains a lack of support staff these activities will continually be imposed on dietitians. Therefore, there is a need for uniformity in employment and placement of dietetic support staff to help in reducing the workloads of dietitians. As a result, dietitians have proposed three categories of support staff (Tables 5, 6 and 7) with aligned activities that can assist in drastically reducing the WISN required numbers of dietitians. It must be noted that the South African HRH strategy has prioritised health care providers but excludes administrative and support staff due to data limitations and time constraints.[2] This study clearly shows the need to include support staff when determining the staffing needs of dietetic professionals. Furthermore, there is a need to ensure an adequate balance between support staff and the skilled professional as one cannot replace the other[7]. Hospitals are encouraged to aim towards at least meeting the basic health service activities as portrayed in Scenario 1 as an initial steppingstone towards the final goal. This goal should indeed be the WISN requirements as portrayed in Scenario 2, backed by dedicated dietetic support staff. However, should hospitals decide to proceed without the assistance of support staff then the higher WISN requirement for dietitians as shown in Scenario 3 will apply. This scenario would not be ideal as skilled professionals would be expected to perform tasks that can be performed by less expensive support staff.[27] The

study further exposed a disjuncture between the actual health service activities performed by dietitians and the related recording of such statistics. WISN accounts for differences in services and complexities of care between hospitals, even if they are categorised at the same level.[15] Thus, the need for individual hospital service statistics to support a standardised list of health service activities is neccessary. The process allows for the use of already available annual data to assess and determine workloads.[15] The accuracy of the WISN method is said to be dependent upon the accuracy of the statistics used to determine workloads.[15] The development of a standardised list of workload components (Tables 1, 2 and 3) can assist in the standardisation of annual health service statistics by improving the accuracy in assessing the actual workloads of dietitians in the future.[3, 15] The use of activities in Table 1 as a basic minimum for the collection of annual health service statistics will ensure that staff allocations are based on the accuracy of the statistics reported annually.[14, 15, 17] Whilst it is true that the calculated WISN requirements in Tables 8, 9, 10 and 11 may be an underestimation based on incomplete statistics for some hospitals (Figure 10), it still provides the first stride towards meeting the dietetic needs of all hospitals.

Findings also revealed the need for clear distinctions between standby, on-call and overtime services performed by dietitians. The highlighted challenges of providing overtime to compensate for staff shortages deserves urgent attention to reduce workload pressures. It must be noted that dietitians' frustrations regarding the need to perform overtime for the completion of daily tasks as a result of high workloads can lead to low levels of moral and motivation.[7, 14] Hence, the calculated WISN ratios provide policy makers and managers with a clear view of hospitals currently experiencing the highest workload pressures allowing for the initial prioritisation of such facilities.[14]

Finally, (9) out of a total of (21) hospitals showed major shortfalls in managerial and supervisory posts required for the effective management of dietetic units. Hence, the need for production dietitians to shoulder the additional burden of managerial duties. It is recommended

that hospitals without such posts prioritise the need for managerial posts, this to improve the management of dietetic units.

Facilities are encouraged to repeat this WISN exercise periodically due to possible changes in service demands[14]. Reviews can be beneficial when aligned to health and human resource plans allowing for effective and efficient forecasting of staff.[5, 14, 18, 19, 21]

Conclusion

South Africa`s central and tertiary public hospitals are not meeting the demands for dietetic services. In South Africa, WISN reveals severe understaffing of the cadre with dietitians being exposed to extreme work pressures because of high workloads. The highlighted need for managerial posts and support staff in hospitals can allow for better task allocation resulting in the omission of unnecessary overtime and reduced workloads for the existing dietitians.

The WHO WISN methodology served useful in highlighting current challenges, portraying the dire need to prioritise dietetic staff, and a basis for the provision of suitable recommendations. This was based on actual workloads and expert professional opinion resulting in the determination of recommended staffing norms for the said level of care.[14] It is hoped that the outcomes of this study will provide managers and policy makers with the necessary guidance to improve the future needs of the cadre. It is also recommended that similar studies be prioritised to further assist in determining the dietetic needs of regional, district and specialised levels of care.

List of abbreviations

Assistant Director, ASD

Available Working Time, AWT

Chief Director, CD

Deputy Director, DD

Department of Public Service and Administration, DPSA

Health Professions Council of South Africa, HPCSA

Human Resources for Health, HRH

Occupation Specific Dispensation, OSD

Production Dietitian, PD

Primary Health Care, PHC

South Africa, SA

South African Nursing Council, SANC

South African Pharmacy Council, SAPC

Sustainable Developmental Goals, SDGs

Universal Health Coverage, UHC

World Health Organisation, WHO

Workload Indicators for Staffing Need, WISN

Declarations

Ethics approval and consent to participate:

Ethics approval was obtained through the Research Ethics Committee, Faculty of Health Science at the University of Pretoria in South Africa. The study was registered and approved for data collection via the National Health Research Database.

Consent for publication:

Consent for publication was obtained through the South African National Health Research Database, corresponding provincial research committees and hospital research committees where applicable.

Availability of data and materials:

The datasets generated and/or analysed during the current study are not publicly available due to these being the property of the South African Department of health but are available from VNN on reasonable request and with permission and approval from the South African Department of Health and its corresponding research committees at provincial and hospital level.

Competing interests:

The authors declare that they have no competing interests. VNN is currently employed by the South African Department of Health and declares that this study was performed in an academic manner to fulfil all requirements as stipulated by the University of Pretoria for purposes of a PHD. This study aimed to academically position this work for further improvements in dietetics.

Funding:

No external funding was obtained to conduct this study. This study was conducted through means of the author's (VNN) personal budget.

Author`s contributions:

VNN, HL and JM were responsible for the conceptualisation and design of the study. HL and JM supervised data collection and analyses. VNN, HL and JM contributed to the drafting, writing, and editing of this paper. KN was responsible for the critical review of the draft manuscript. All authors read, reviewed, and approved the article.

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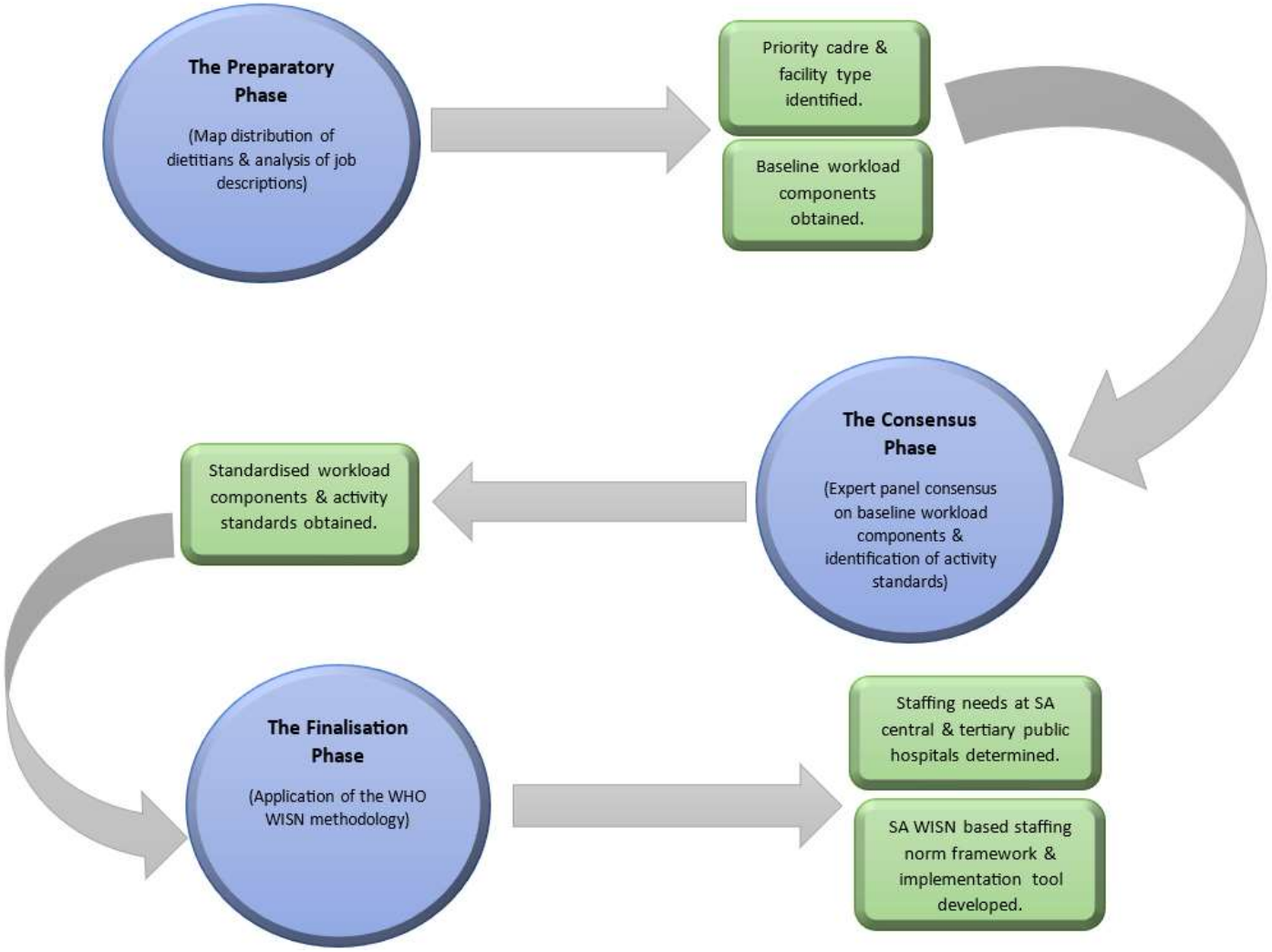

Figure 5. Finalisation Phase: A Staffing Norm Framework and Implementation Tool for Dietitians: A South African Workload Indicators of Staffing (WISN) Study.

CHAPTER FIVE: UNPUBLISHED MANUSCRIPT TWO

The previous chapter resulted in the determination of dietetic staffing needs at the 21 central and tertiary public hospitals. However, workforce assessments cannot be done once-off and are required periodically to ensure current and appropriate forecasting of staffing needs. As a result, context specific and user-friendly tools are beneficial in ensuring that these assessments take place timeously. Therefore, this chapter provides details on the development of a context and cadre specific staffing norm framework and South African excel implementation tool in meeting the final objective of this study as shown below.

This Chapter has been formatted as per the submission guidelines for the BMC: Human Resources for Health Journal. The manuscript has been submitted to the journal with the following reference number: HRHE-D-23-00171. Proof of submission is provided in Appendix 12.

A staffing norm framework and implementation tool for dietitians: A South African Workload Indicators of Staffing Need (WISN) study

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Abstract

Background: The global Human Resources for Health strategy emphasizes the need to invest in human resources to improve the provision of quality services. South Africa`s quadruple burden of diseases demands that nutrition services be integrated into a comprehensive health care package. In this study, we used the World Health Organization's Workload Indicators of Staffing Need (WISN) methodology to develop a dietetic staffing norm framework for South African central and tertiary public hospitals.

Methods: We followed the eight step WISN methodology. Firstly, nine provincial nutrition managers participated in an online survey to provide baseline data on the numbers, vacancies, and job descriptions of dietitians. Job descriptions of dietitians were thematically analyzed to obtain current staffing practices. Secondly, head dietitians of 21 out of 22 central and tertiary public hospitals participated in an online consensus exercise using the Delphi technique. We compiled a standardized list of dietetic workload components and activity standards. All data were analyzed using Microsoft Excel and the Statistical Package for the Social Sciences.

Results: Findings revealed a total of 42 and 142 dietitians at five central hospitals and 17 tertiary hospitals respectively, with an available working time of 1520 hours a year. Consensus

data revealed standardized lists of workload components and activity standards. The standardization of available working time, workload components, and activity standards resulted in the development of a South African staffing norm framework supported by an implementation tool for dietitians at central and tertiary public hospitals.

Conclusion: The WISN methodology is a versatile tool that allows for the development of context and cadre specific staffing norm frameworks and tools. The standardization of workload components and activity standards represents the unique staffing needs of individual hospitals. These results will help policy makers to plan and forecast dietetic staffing needs at a macro level.

Keywords: Dietitian, Human Resources for Health, South Africa, Staffing Norm, Workload Indicators of Staffing Need

Background

To ensure universal health coverage and ensure health security, there is a global need to invest in Human Resources for Health (HRH) and address shortages of health workers while improving their distribution for quality essential healthcare services [1]. The World Health Organization (WHO) African region reports a low health worker density with an average density of 1.55 per 1000 population [2]. In contrast, South Africa exhibits a higher health worker density, exceeding the proposed Sustainable Development Goal threshold, with a density of above 4.45 per 1000 population [2].

Unfortunately, the availability of health workers alone is not enough to ensure quality essential healthcare services; HRH also needs to be accessible, acceptable, and of high quality [1, 3]. Recent studies emphasize the importance of a diverse skill-mix among health professionals to ensure delivery of high-quality patient care [4-6]. The WHO African Region states that a density of 0.09 dietitians and nutritionists per 10 000 population are needed to achieve at least 70% universal health coverage [7]. However, specific data regarding the dietetic cadre are lacking.

In South Africa, the newly proposed National Health Insurance aims to provide affordable, quality healthcare services for all regardless of their socio-economic status [8]. To radically transform the healthcare system and enable the National Health Insurance, there is a need to invest in the health workforce. To guide investment, a task team was appointed to develop the South Africa HRH strategy [9], addressing various cadres but lacking specific data for dietitians [9]. South Africa`s quadruple burden of diseases increases the demand for nutrition services [9-11], making qualified and registered nutrition professionals significant role players in the multidisciplinary team [12].

Evidence-based HRH planning is essential to determine the optimal balance of dietitians to address staff shortages [13]. Staff shortages can limit the quality of services offered to patients [14, 15], particularly in the public sector where an unbalanced skill mix and lack of support

staff can lead to a high workload for dietitians. The South African HRH strategy acknowledges the need for national capacity, skills, and credible planning models to address these concerns effectively [9].

Inflexible staffing norms have resulted in rigid staffing patterns that do not account for staff workloads or the complexities of population health needs, especially in less developed countries [16-18]. The WHO Workload Indicators of Staffing Need (WISN) method offers a flexible staffing norm based on health workers' workloads, considering the actual time required to complete workload components [18]. The use of workload-based staffing norms is essential for accurately determining staffing needs at health facility level [19, 20]. A recent study, by Mabunda, Gupta [21], recommended the adoption of the WISN method as a modelling tool for South Africa`s staffing requirements, allowing for gradual implementation based on available resources.

Consequently, this study aimed to develop a WISN-based staffing norm framework for dietitians in South African central and tertiary public hospitals. An evidence-based framework will provide policy makers with tools for policy dialogue, revising current staffing norms, and making informed decisions on staff distribution in South African healthcare settings [4].

Methods

We adopted the WISN approach (Fig 1) as the conceptual and empirical framework for this study. Data collection and analysis informed the process of developing a tailored end-user tool that incorporates appropriate evidence and data in planning for dietitians in the South African context [18].

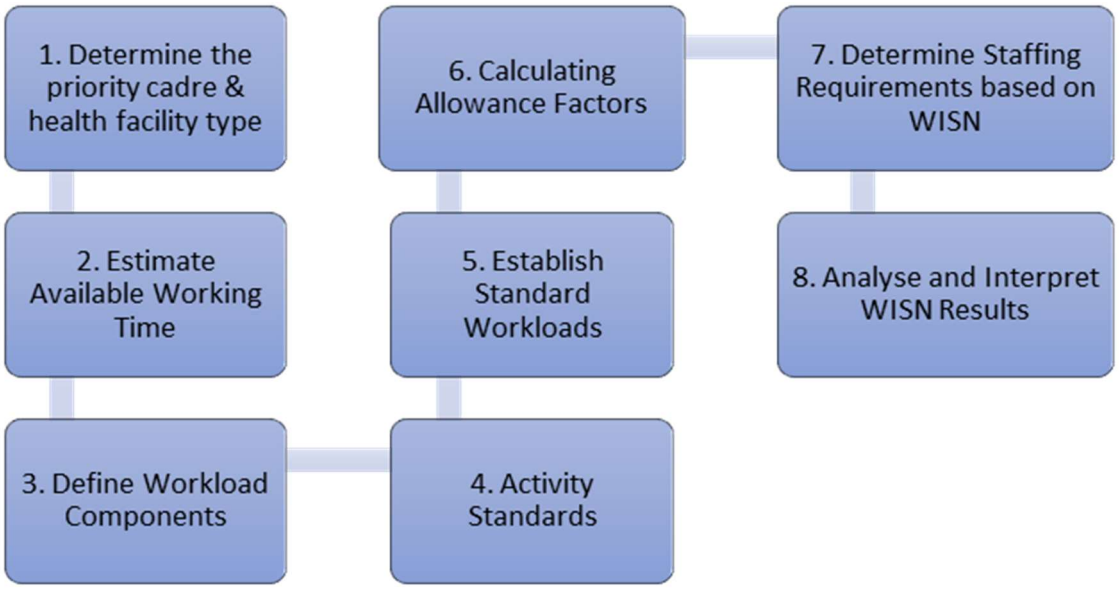

Figure 1. The World Health Organization Workload Indicators of Staffing Need (WISN) eight step methodology [18].

Data collection

We estimated Available Working Time (AWT) (step 2) using the WISN formula (see equation 1) and guidance from the South African Basic Conditions of Employment Act [22] while data needed for the rest of the steps were collected in two sequential phases from two groups of participants.

Phase one

In this phase, the priority cadre and health facility type (step 1) were identified, and the data required for defining workload components (step 3) were obtained. Provincial nutrition managers were purposively sampled. All nine provincial nutrition managers completed a structured online questionnaire detailing the number of permanent dietitians working at South African public hospitals at all levels and the job descriptions for tertiary and central hospitals. Data were analyzed using Microsoft Excel, and the Quantum geographic information system was used to map the provincial distribution of dietitians employed at all public hospitals in South Africa from September 2021 to January 2022 (Fig 2). For purposes of this study, we

chose only the central and tertiary levels of care because these hospitals had at least one permanently employed dietitian at the time. The job descriptions were thematically analyzed using the three categories (health service, support service, and additional/individual service activities) of workload components as described in the WHO WISN manual [18].

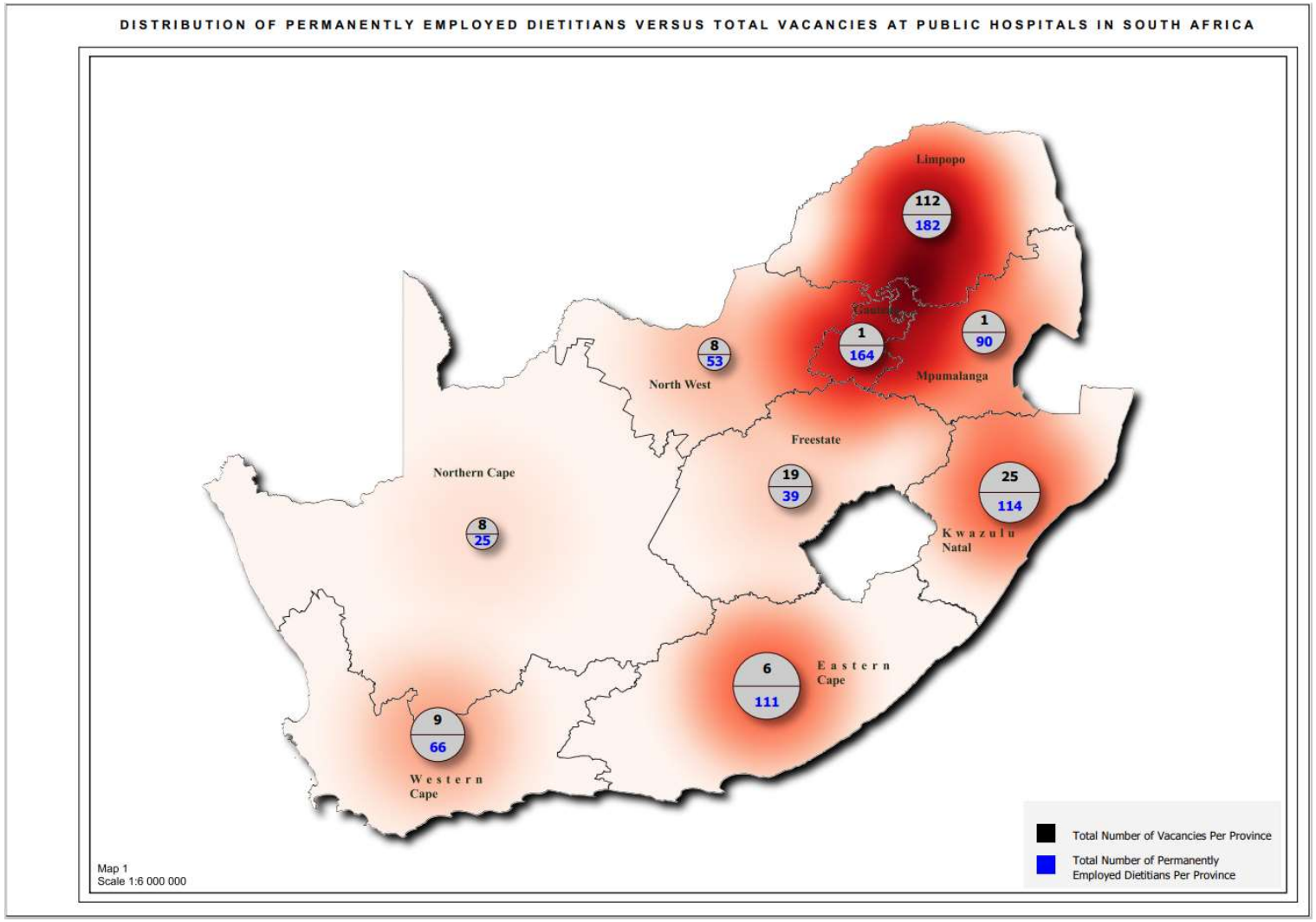

Figure 2. Distribution of permanently employed dietitians versus total vacancies at public hospitals in South Africa

Phase two

A purposive sample of head dietitians at South African central and tertiary public hospitals was used. Twenty-one of 22 head dietitians at these two levels of care participated in an online iterative consensus building exercise [23]. Participants participated in multiple rounds until they agreed on the workload components and related activity standards (steps 3 and 4) of dietitians at South African central and tertiary public hospitals. Three rounds of questionnaires were presented to all 21 participants who were given at least 2 weeks to complete each round. The questionnaire comprised workload components of dietitians identified from the thematic analysis of the job descriptions. During the first round, participants rated the proposed workload components using a 5-point Likert scale (strongly disagree, disagree, do not disagree/agree, agree, and strongly agree) and were given the opportunity to suggest other workload components. During the second round, participants were presented with a summary of the first round and invited to provide further suggestions or comments on the summarized list of workload components. Participants also suggested activity standards for the summarized list of workload components in this round. During the third round, participants were given a summary of the first two rounds and were asked to review and confirm the final list of workload components and activity standards. All 21 participants responded to the three rounds completing both structured and open-ended questions as required [24]. After each round, data were analyzed using Microsoft Excel and the Statistical Package of the Social Sciences (SPSS).

The remaining WISN steps were then applied to draft and develop a dietetic staffing norm framework for South African central and tertiary public hospitals as shown in Figure 3 [18]. This framework was further operationalized through the development of a Microsoft Excel implementation tool (Annexure 1). The tool was made functional by applying the generic WHO WISN methodology yet contextualized to determine the specific need for dietitians at South African central and tertiary public hospitals [9].

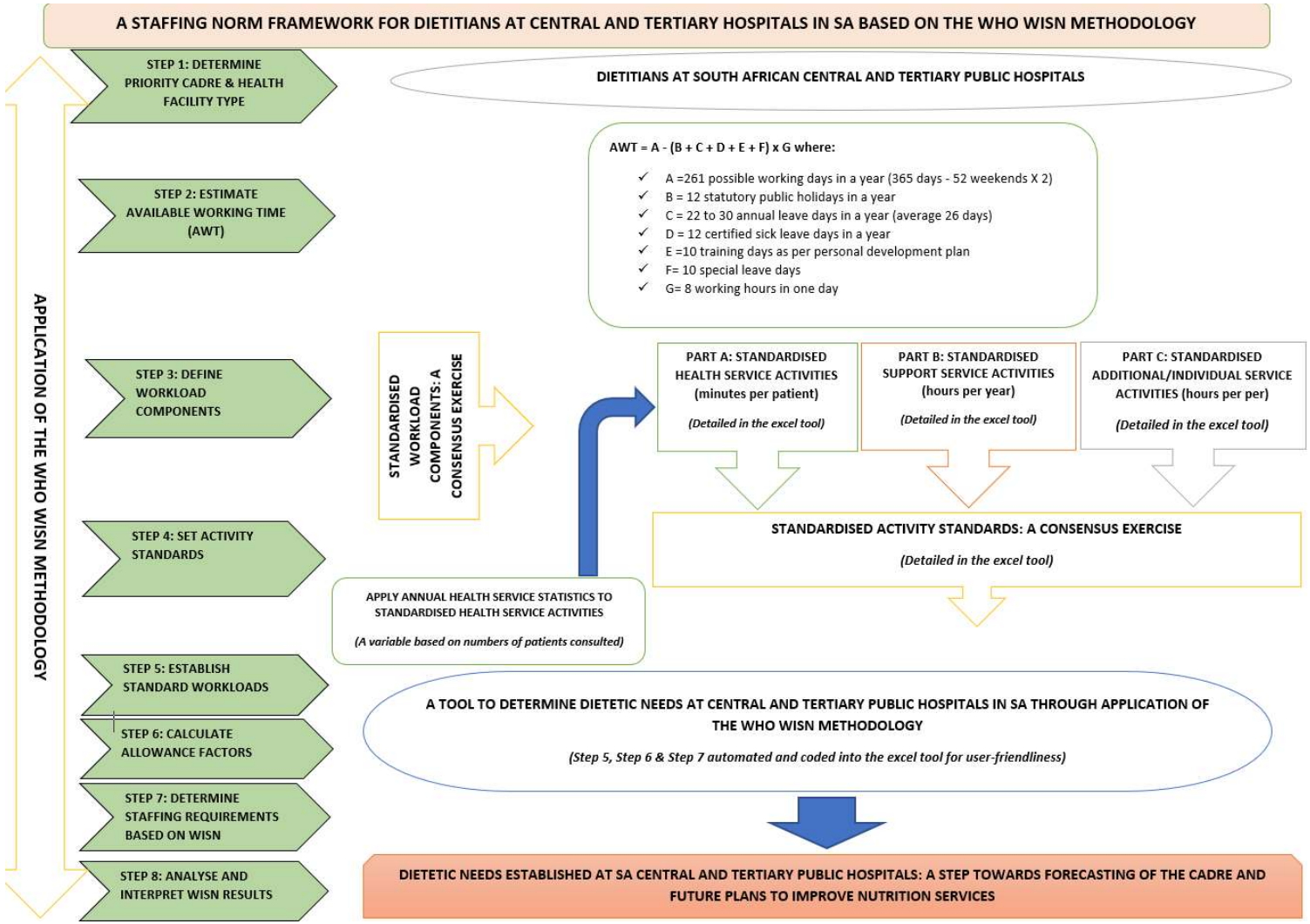

Figure 3. A WISN based staffing norm framework for dietitians at South African central and tertiary public hospitals

Results

Step one: Determine the priority cadre and health facility type: *Current status of dietitians in central and tertiary hospitals*

Out of 360 public hospitals in South Africa, there are five central and 17 tertiary hospitals. Central hospitals had 42 permanently employed dietitians and four vacant posts. Tertiary hospitals had 142 permanently employed dietitians and 17 vacant posts.

Step two: Available working time

According to labor regulations, dietitians may potentially work an average of 8 h a day excluding weekends without considering overtime as aligned to the South African Basic Conditions of Employment Act, 1997 (Act 75 of 1997) (BCEA) [22]. According to best practice, staff who work 8 h a day for 5 days per week across 52 weeks in a year can work on average 173.33 h per month and 21.67 days per month. This translates to a total of 2 079.96 h per annum or 260.04 days per annum. The best practice guidelines do not factor in annual and sick leave entitlements as per sections 20 and 22 of the BCEA [22]. According to the WISN methodology, available work time (AWT) should consider the specific contextual circumstances of employees working at central and tertiary public hospitals as follows [18]:

AWT = A - (B + C + D + E + F) x G (equation 1)

- ✓ A = 261 possible working days in a year (365 days - 52 weekends X 2)
- ✓ B = 12 statutory public holidays in a year
- ✓ C = 22 to 30 annual leave days in a year (average 26 days)
- ✓ D = 12 certified sick leave days in a year
- ✓ E = 10 training days as per personal development plan
- ✓ F = 10 special leave days
- ✓ G = 8 working h in one day

Using equation 1, we calculated the AWT for a permanently employed dietitian at central and tertiary public hospitals as 38 weeks or 191 days translating to 1528 h per year or 91680 min per year.

Steps three and four: Workload components and activity standards

Tables 1, 2 and 3 show the workload components and related activity standards that resulted from the consensus exercise. According to the WISN tool, workload components can be defined as “work activities that take up most of a health worker`s daily working time”. Workload components can be categorized as health services, support services, or additional service activities. Health service activities are performed by all members of the cadre and require the collection of health statistics [18] (Table 1). Support service activities are also performed by all members of the cadre, but statistics are not regularly collected on these [18] (Table 2). Lastly, additional service activities are not performed by all members of the cadre and regular statistics are not collected for these activities [18] (Table 3). Activity standards represent the amount of time needed to perform each workload component to professional standards [18].

Table 1. Workload components for health service activities and related activity standards

Health service activities	Activity standard (min per patient)
Ward rounds (individual and multidisciplinary)	10
Patient screening	5
Inpatient consultation and treatment (new)	30
Inpatient nutritional assessment (ABCDE) & diagnosis (new)	15
Inpatient calculation of nutritional requirements & development of nutrition intervention plans (new)	15
Inpatient nutrition support and dietary counselling (new)	30
Inpatient consultation and treatment (FU)	15
Inpatient referral, communication with the multidisciplinary team and related activities	10
Outpatient consultation and treatment (new)	45
Outpatient nutritional assessment (ABCDE) & diagnosis (new)	15
Outpatient nutritional plan and Intervention including dietary counselling (new)	30
Outpatient consultation and treatment (FU)	30
Outpatient specialist clinics	45
Report writing and patient notes	15
Referral process between health facilities	10

Table 2. Workload components for support service activities and related activity standards

Support activities	Activity standard (h per year)
Food service management (developing and updating of cycle menus, therapeutic diets & related diet sheets)	24
Development and review of policies, protocols, and guidelines (Including related IEC materials)	36
Dietetics departmental meetings	38
Hospital committee/ internal stakeholder meetings	44
Meetings with industry representatives and other external stakeholders	18
Own performance development and management system (PMDS) reporting	8
Continued professional development (CPD) activities	24
Participation in journal reviews and working groups	38
In-service training to the multidisciplinary team (nurses, doctors etc)	12
In-service training to the food service team	8
Student mentoring, evaluation & reporting (Including meeting with universities and accreditation of facilities)	90
Attend training (generic)	18
Recordkeeping, statistics & report writing	48
Peer reviews and clinical audits	24
Outpatient health awareness events/campaigns/open days (planning and participation)	20

Table 3. Workload components for additional service activities and related activity standards

Additional/individual activities	Activity standard (hours per year)
Managerial duties (risk management, financial management (budgeting and procurement), asset management, planning of duty rosters)	24
Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	24
Develop and review departmental plans (strategic, business, and operational)	16
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	24
Report writing, validations, and presentations	36
Human resource management (recruitment, selection of new staff, grievances and disciplinary processes, HPCSA registration & compliance, attendance and leave register)	48
Orientation of new staff, training, support and supervision of lower-level staff and community service dietitians	191
Performance development and management System (PMDS)	20
Participation in research activities	24
National core standards/quality Improvement programs (QIP)-develop plans, evaluation, and reports	19
Planning and coordination of departmental meetings	36
District, provincial integrated nutrition program (INP) and allied meetings	24
Mother baby friendly initiative (MBFI) mentor/committee participation and activities	24
Education, training and supervision of foodservice/diet kitchen staff/milk kitchen/tube feed personnel	53

Steps 5, 6, 7, and 8: Standard workloads, allowance factors, and staffing requirements

To allow ease of use in the South African dietetics' context, the elaborate formulae used in the WHO WISN software were used to develop a South African Excel tool or calculator together

with a user-friendly instruction sheet presented in Annexure 1 and 2. The South African Excel tool requires the input of individual health service statistics of health service activities. The WISN software also calculates standard workloads, allowance factors, and determines the staffing requirements for specific cadres [16, 18]. Consequently, these same steps were incorporated and coded into the excel tool. Next, we incorporated the formula for standard workloads for each of the 15 health service activities included in Table 1.

Standard workload

Standard workload is the amount of work associated with one activity that one dietitian could do in a year. Standard workload is calculated as AWT divided by the activity standard of a particular task.

Standard workload = AWT/activity standard (**equation 2)**

As dietitians do not only perform health service activities, there was a need to include support service and additional service activities when calculating total workload.

Therefore, allowance standards for support service (Table 2) and additional service activities (Table 3) were also included. The WISN calculates the category allowance standard (CAS) as the total percentage of time spent on all support service activities in a year. Additionally, the tool was coded to calculate the total number of dietitians required to perform health service and support service activities using the category allowance factor (CAF) [18]. The CAF was incorporated into the tool using the following formula:

CAF=1/ [1-(TOTAL CAS /100)] (equation 3)

Thereafter, we added the individual allowance standard (IAS) which was the total time certain dietitians took to perform all additional activities in a year. The total IAS would be used to calculate individual allowance factor (IAF) which is the staff required to cover additional activities of certain dietitians as follows [18]:

IAF = Total IAS/AWT (equation 4)

IAF was a factor that was added to the total calculation and was not a multiplier such as the CAF [18].

Finally, staffing requirement was incorporated using the following formula:

Number of dietitians = (A X B) + C (equation 5)

Where:

- A = staffing required for health service activities (Group A)
- B = CAF (Group B)
- C = IAF (Group C)

This would allow the user to calculate the number of required dietitians in relation to the number of currently employed dietitians, allowing one to assess the degree of under or over staffing.

WISN difference = Current number of dietitians – required number of dietitians (equation 6)

The tool further allows for the calculation of the WISN ratio as a proxy measure providing an indication of work pressures [18].

WISN ratio = Current number of dietitians/required number of dietitians (equation 7)

Where:

A ratio of more than 1 = overstaffing

A ratio of equal to 1 = adequate staffing

A ratio of less than 1 = understaffing

The South African excel implementation tool is thus based on the WHO WISN software and uses the same formula as guided by the WISN user's manual [18].

Validation of the SA tool against the WISN software

The results obtained using the two tools (WHO WISN software and South African excel tool) for all 21 hospitals are presented in Table 4. The WHO WISN software calculated that on average 24.59 dietitians need to be employed at each hospital, whilst the South African Excel tool calculated this value at 24.23. On average, the WHO WISN software value and the South African Excel tool value differed by 0.36, representing a percentage deviation of 1.46. Based on this small percentage deviation, our results suggest that the South African Excel tool can be used in the South African context.

Table 4. Staffing requirements calculated by the WISN software and the South African excel tool

Hospital	WISN Software (A)	SA Tool (B)	Absolute Deviation (A-B)	Percentage Deviation (Absolute deviation/A x 100)
A001 TH	37.67	37.17	0.50	1.33
A002 TH	22.89	22.60	0.29	1.27
A003 TH	14.87	14.71	0.16	1.08
A004 TH	13.96	13.81	0.15	1.07
A005 TH	15.92	15.74	0.18	1.13
A006 TH	33.61	33.20	0.41	1.22
A007 TH	19.23	19.01	0.22	1.14
A008 TH	34.83	34.41	0.42	1.21
A009 TH	5.84	5.78	0.06	1.03
A0010 TH	30.70	30.30	0.40	1.30
A0011 TH	44.73	43.24	1.49	3.33
A0012 TH	27.47	27.14	0.33	1.20
A0013 TH	24.26	23.94	0.32	1.32
A0014 TH	10.22	10.10	0.12	1.17
A0015 TH	12.08	11.94	0.14	1.16
AOO1 CH	15.95	15.77	0.18	1.13
A002 CH	36.58	36.11	0.47	1.28
A003 CH	20.54	20.26	0.28	1.36
A004 CH	37.90	37.40	0.50	1.32
A005 CH	38.39	37.90	0.49	1.28
A006 CH	18.65	18.40	0.25	1.34
OVERALL AVERAGE	24.59	24.23	0.36	1.46

Discussion

The eight step WISN methodology proved useful and effective for developing a staffing norm framework and implementation tool for dietitians in South Africa. The WISN is a relatively simple method to determine HRH but requires a good understanding of the methodology to accurately implement and complete the necessary calculations [4]. The computerization of WISN in 2010 further improved its usability, and the tool has been adapted for different contexts, several HRH cadres, and across various levels of health care [4, 16]. Facilities do not work in isolation but form part of an integrated health system, thus standardized macro level data can be valuable in strengthening staff projection and forecasting at a country level [4].

The WISN has been implemented in South Africa across a range of cadres at the same time bringing with it affordability challenges [21]. WISN experts advise starting with a few cadres and facilities before implementing the WISN at a large scale [16]. Therefore, the South African framework illustrated in Figure 3 provides a WISN based guide for dietitians supported by an Excel implementation tool specific to central and tertiary public hospitals (Annexure 1). The framework allows for standardization of HRH for a specific cadre, health facility type, AWT, WC, and AS. In our study, we found that it was impossible to standardize the dietetic staffing workloads for different hospitals as staffing workloads depend on health service statistics [6,24]. Health service statistics vary according to the number of current dietetic staff, geographical location, and catchment population.

The framework and implementation tool are able to account for variations in standard workloads, meeting the individual and unique dietetic staffing needs of each hospital [24]. The WHO WISN software has automated the WISN steps allowing for easier calculation of workloads (step 5), allowance factors (step 6), and the determination of staffing needs (step 7) [16]. In this study, we developed the South African implementation tool which uses the same

WHO WISN methodology to calculate staffing needs, whilst allowing for user friendliness. The Excel tool includes the standardized components (Steps 1, 2, 3 and 4) as fixed features for use at all central and tertiary public hospitals. From Step 5 onwards the tool becomes individualized for each hospital, allowing users to input health service statistics and determine actual staffing workloads for each hospital. This allows for the determination of specific dietetic staffing needs based on specific patient data and actual workloads but constructed on standardized AWT, WC, and AS for the central and tertiary health care level in South Africa [4]. A comparison of the hospital staffing requirements calculated using the two tools showed a percentage deviation of less than five, suggesting that the South African tool is a valid tool for use in South Africa.

Conclusion

This study demonstrates the versatility of the WISN methodology and its ability to be adapted for the dietetic cadre in South Africa by developing a national staffing norm framework and implementation tool. The framework aims to help policy makers and managers at central and tertiary hospitals in reviewing current staffing requirements and for future planning, modelling, and forecasting of dietetic HRH. Similar frameworks and tools may be useful for district, regional, and specialized levels of care in the future.

List of abbreviations

Available Working Time, AWT

Category Allowance Factor, CAF

Category Allowance Standard, CAS

Human Resources for Health, HRH

Individual Allowance Factor, IAF

Individual Allowance Standard, IAS

World Health Organization, WHO

Workload Indicators for Staffing Need, WISN

Declarations

Ethics Approval and Consent to participate

Ethics approval was obtained through the Research Ethics Committee, Faculty of Health Sciences at the University of Pretoria (Ethics Number: 97/2021). The study was registered and approved for data collection via the National Health Research Database. Study participants were provided with a formal letter detailing the study and invited to participate in the study. All participants signed an informed consent form prior to the commencement of the study. Consent to participate was completely voluntary. Only consenting individuals were included in the study.

Consent for publication

Consent for publication was obtained through the South African National Health Research Database, corresponding provincial research committees and hospital research committees where applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to these being the property of the South African Department of Health but are available from VNN on reasonable request and with permission and approval from the South African Department of Health and its corresponding research committees at provincial and hospital level.

Competing Interests

The authors declare that they have no competing interests. VNN is currently employed by the South African Department of Health.

Funding

No external funding was obtained to conduct this study.

Author`s contributions

VNN, HL and JM were responsible for the conceptualization and design of the study. HL and JM supervised data collection and analyses. VNN, HL, and JM contributed to the drafting, writing, and editing of this paper. VNN, HL, JM and KN contributed towards the development of the Excel Tool. KN was responsible for the critical review of the draft manuscript. All authors read, reviewed, and approved the article.

Acknowledgements

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Appendix 14: WISN Based South African Excel Tool (Added as a separate attachment)

Appendix 15: User-Instruction Sheet

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CHAPTER SIX: DISCUSSION AND CONCLUSION

This is the first study aimed at developing a staffing norm framework for dietitians at central and tertiary public hospitals in South Africa (SA). The aim was accomplished through application of the WHO WISN tool as a basis.[1] The main study findings are presented as manuscripts in the three previous chapters (Chapters 3 - 5). This general discussion provides a systematic summary of the study and its key findings as per the aligned objectives in the three phases of the study namely: preparation, consensus, and finalisation as shown in Figure 1. These study findings were presented at a research day as per Appendix 13. This section is also integrated with a narrative of the personal reflections of the researcher through the study journey.

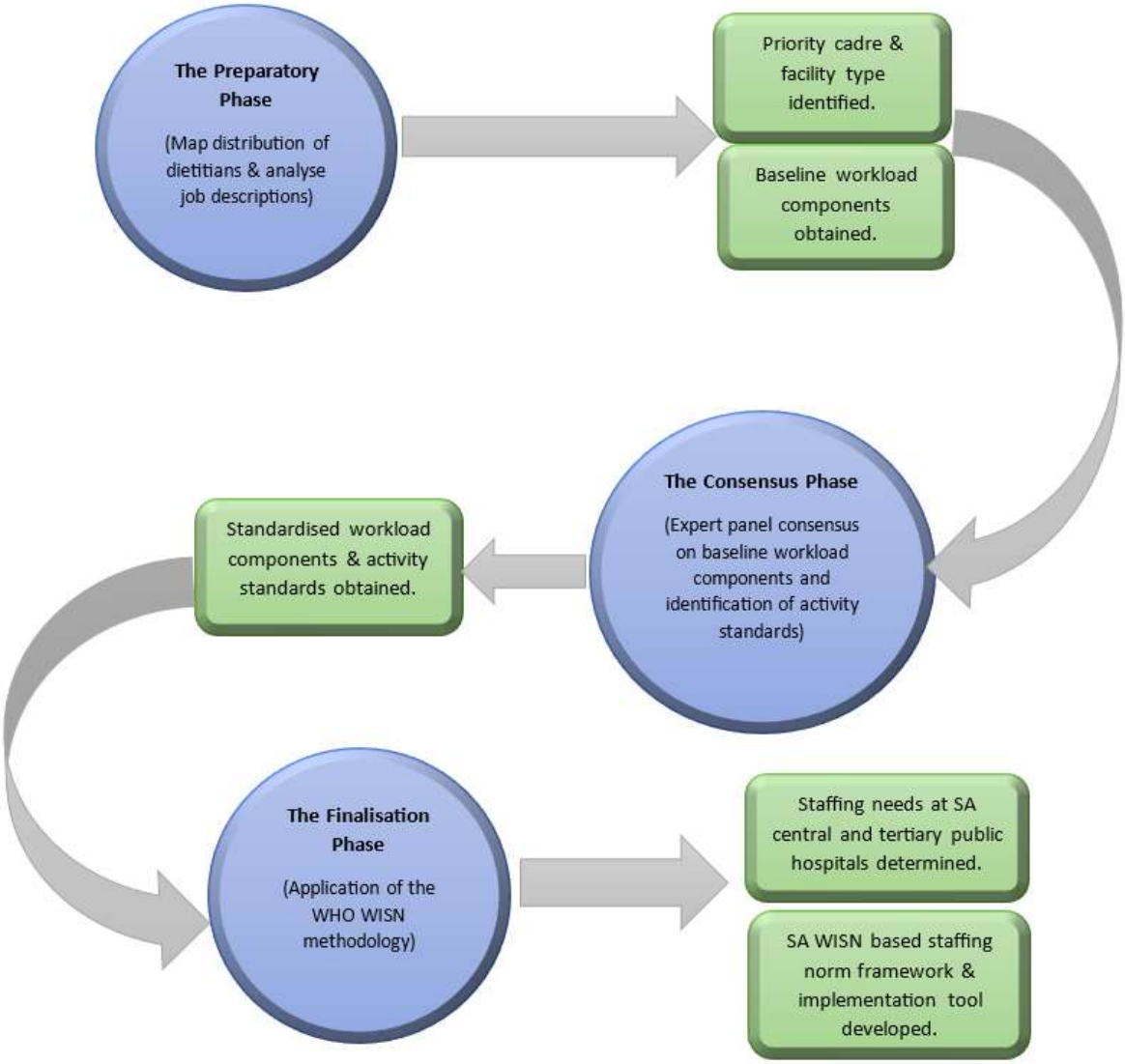

Figure 6. The Final Conceptual Framework of the Thesis based on the WHO WISN Methodology.

6.1 Preparation: The Baseline Assessment

6.1.1 What is the current distribution of dietitians in the South African public hospital sector?

As with any workforce study, it is imperative that there is an initial baseline of the current staffing prior to the determination of the actual staffing requirements.[1] As a researcher, it was assumed that such information would readily be available through a national human resource database. However, my experiences uncovered challenges with the availability and accessibility of a national database. Thus, there was a need to embark on a national survey to collect, confirm and map the actual distribution of dietitians at the South African public hospital level. This data certainly served useful as a baseline for this study.

Results from the survey indicated a total of 844 permanently employed dietitians and 189 available dietetic vacancies at SA`s public hospitals during the period of September 2021 to January 2022. The spatial distribution of dietitians per province (Figure 2) showed that the Limpopo (LP) province had the highest concentration (n=182), followed by Gauteng (GP) (n=164), KwaZulu Natal (KZN) (n=114) and the Eastern Cape (EC) (n=111). The rest of the provinces had numbers below 100 dietitians with the Northern Cape (NC) having the smallest number of 25.

This distribution was then further broken down to provide a better indication of the actual numbers of dietitians per level of hospital as shown below in Figures 2, 3, 4, 5 and 6. Central hospitals had a total of 42 dietitians, with the highest concentration seen in the Western Cape. (Figure 3). Tertiary hospitals had a total of 142 dietitians, with GP having the highest concentration and the highest number of hospitals (Figure 4). Regional hospitals had a total of 210 dietitians with GP again having the highest concentration yet holding the second highest number of hospitals in this category (Figure 5). The district level had a total of 401 dietitians, with the highest concentration in LP, yet the province had the 4th highest number of hospitals (Figure 6). Specialised hospitals had a total of 49 dietitians with three provinces (LP, GP and KZN) having the highest concentrations, yet the EC province holds the highest number of hospitals for this level of care (Figure 7).

It was clear at this stage that this data only provided an idea of the current distribution of dietitians; but not whether these numbers were adequate to meet the demands for nutrition services in South Africa. Hence, informed by reviewed literature the evidence based WISN tool was chosen, to determine the adequacy of these numbers, focussing on the central and tertiary level of care for this study.[1]

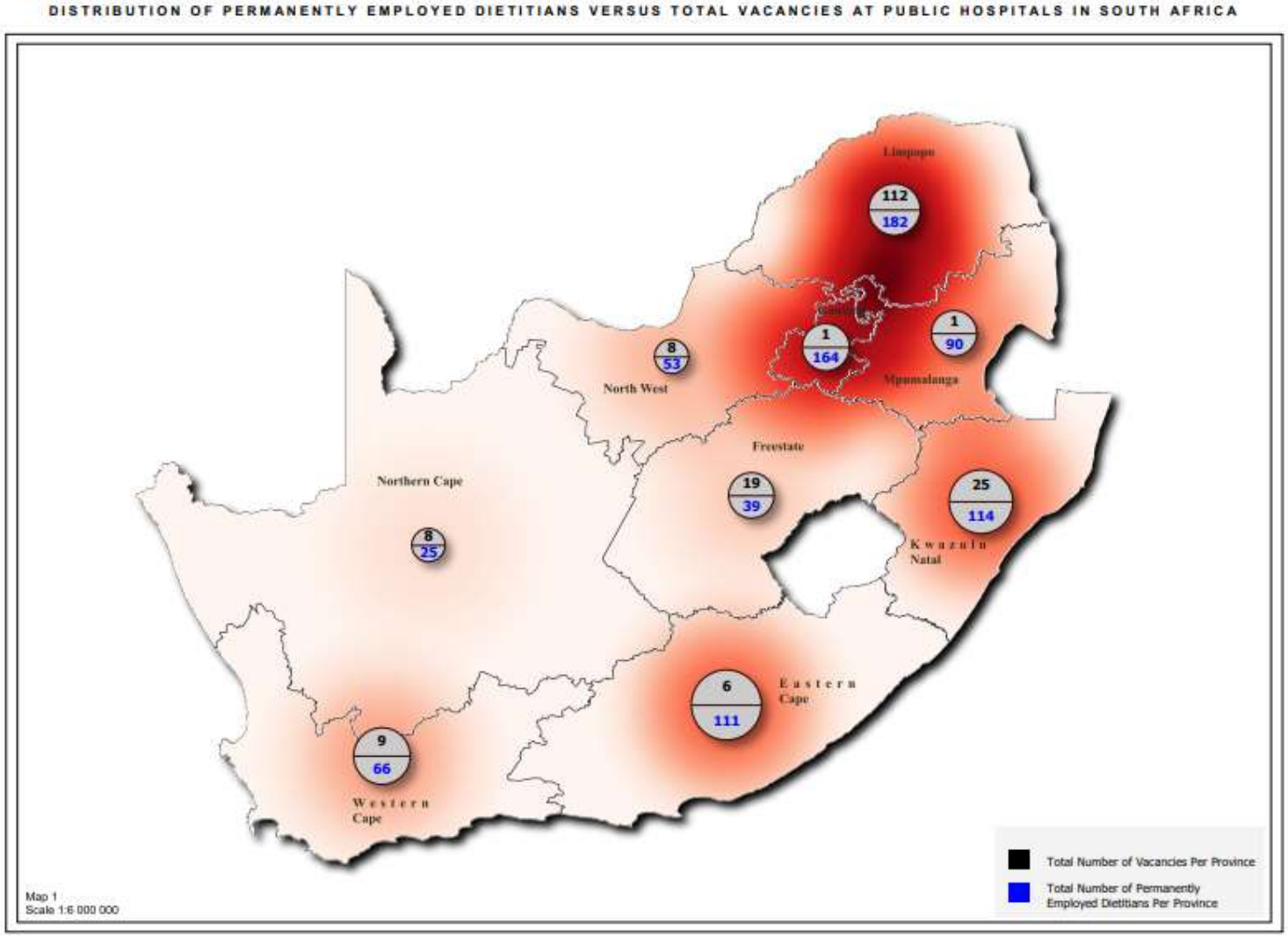

Figure 7.Distribution of Permanently Employed Dietitians Versus Total Vacancies at Public Hospitals in South Africa.

DISTRIBUTION OF PERMANENTLY EMPLOYED DIETITIANS VERSUS TOTAL VACANCIES AT CENTRAL HOSPITALS IN SOUTH AFRICA

Province	Number of Central Hospitals
Eastern Cape	1
Free State	1
Gauteng	0
Kwazulu Natal	1
Limpopo	0
Mpumalanga	0
Northern Cape	0
North West	0
Western Cape	2

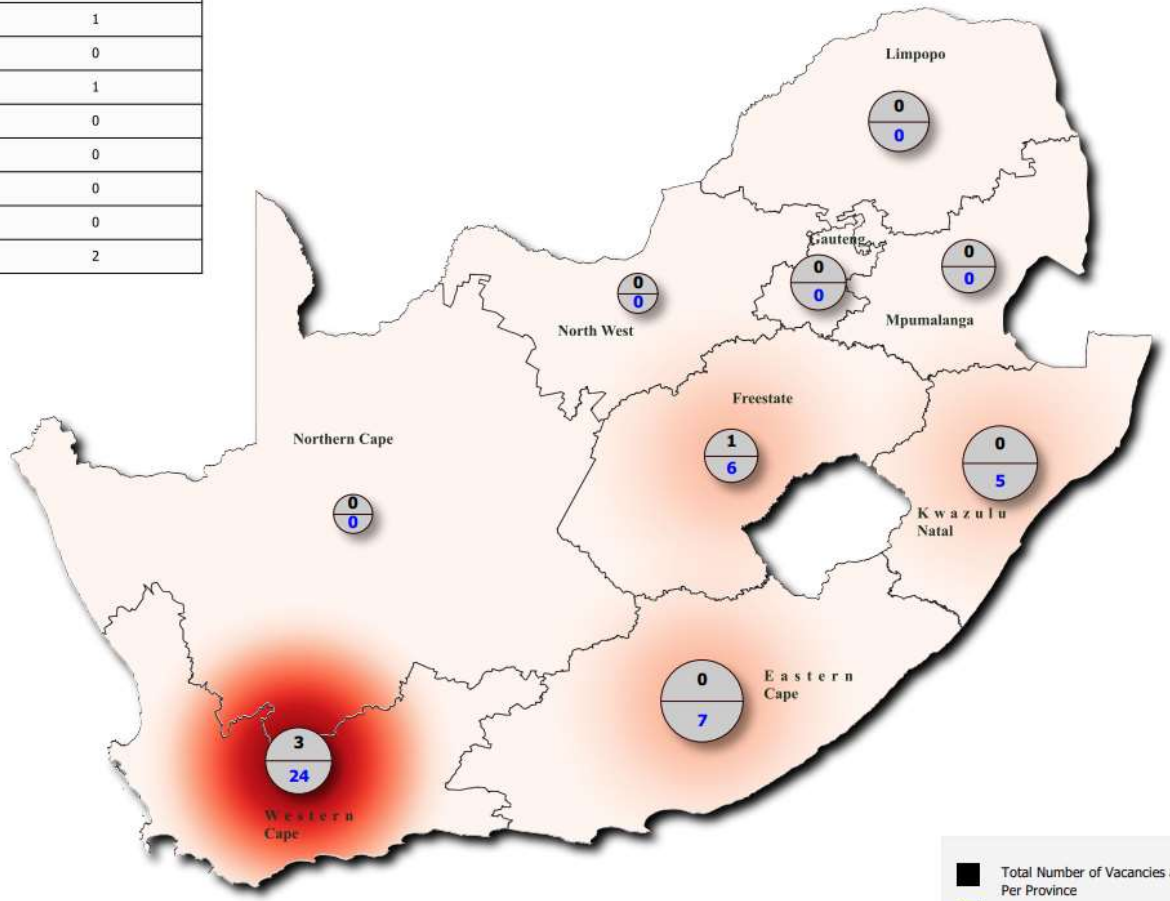

Figure 8. Distribution of Permanently Employed Dietitians Versus Total Vacancies at Central Public Hospitals in South Africa.

DISTRIBUTION OF PERMANENTLY EMPLOYED DIETITIANS VERSUS TOTAL VACANCIES AT TERTIARY HOSPITALS IN SOUTH AFRICA

Province	Number of Tertiary Hospitals
Eastern Cape	2
Free State	1
Gauteng	5
Kwazulu Natal	1
Limpopo	2
Mpumalanga	2
Northern Cape	1
North West	2
Western Cape	1

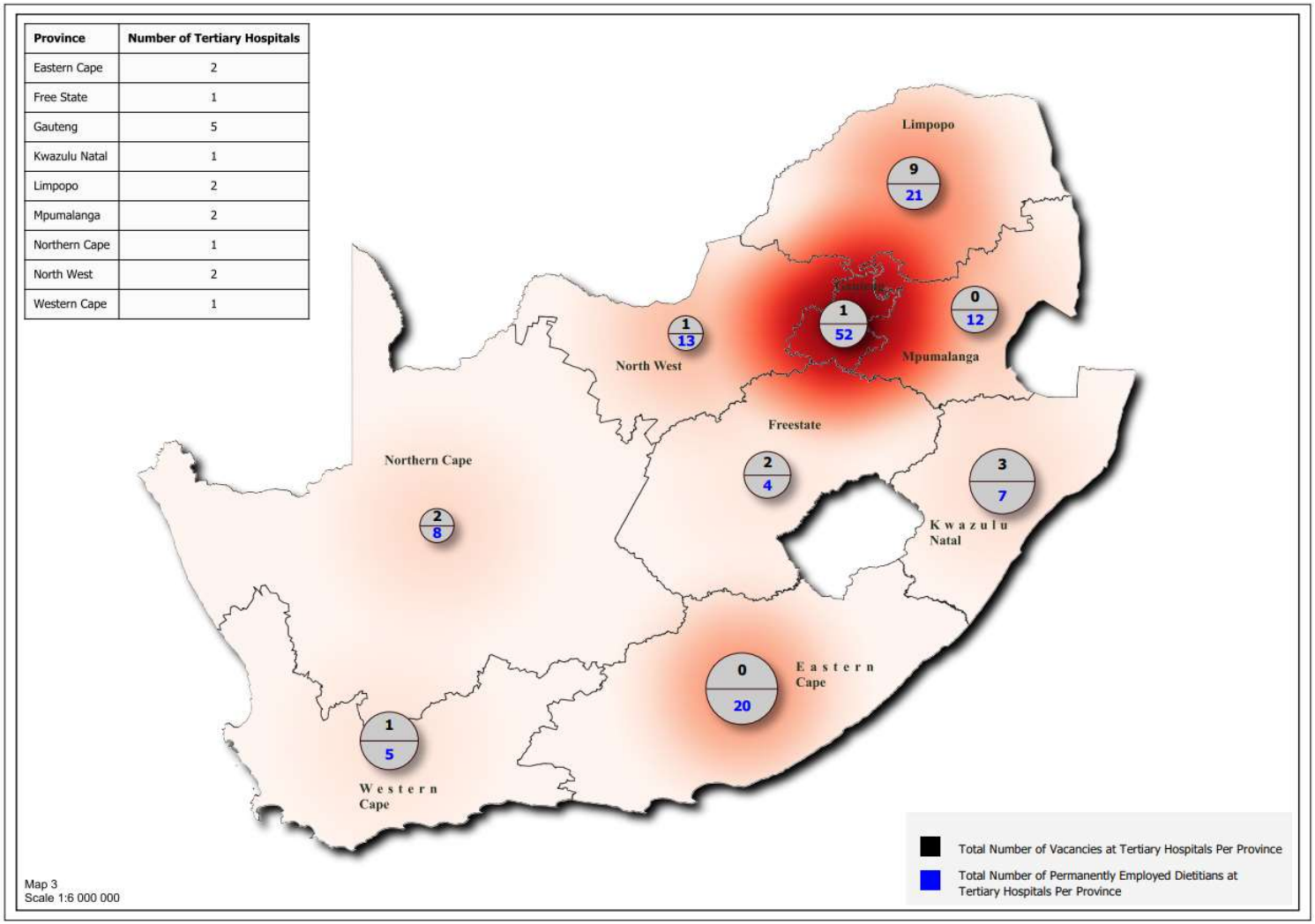

Figure 9. Distribution of Permanently Employed Dietitians Versus Total Vacancies at Tertiary Public Hospitals in South Africa.

DISTRIBUTION OF PERMANENTLY EMPLOYED DIETITIANS VERSUS TOTAL VACANCIES AT REGIONAL HOSPITALS IN SOUTH AFRICA

Province	Number of Regional Hospitals
Eastern Cape	6
Free State	4
Gauteng	9
Kwazulu Natal	15
Limpopo	5
Mpumalanga	2
Northern Cape	1
North West	3
Western Cape	4

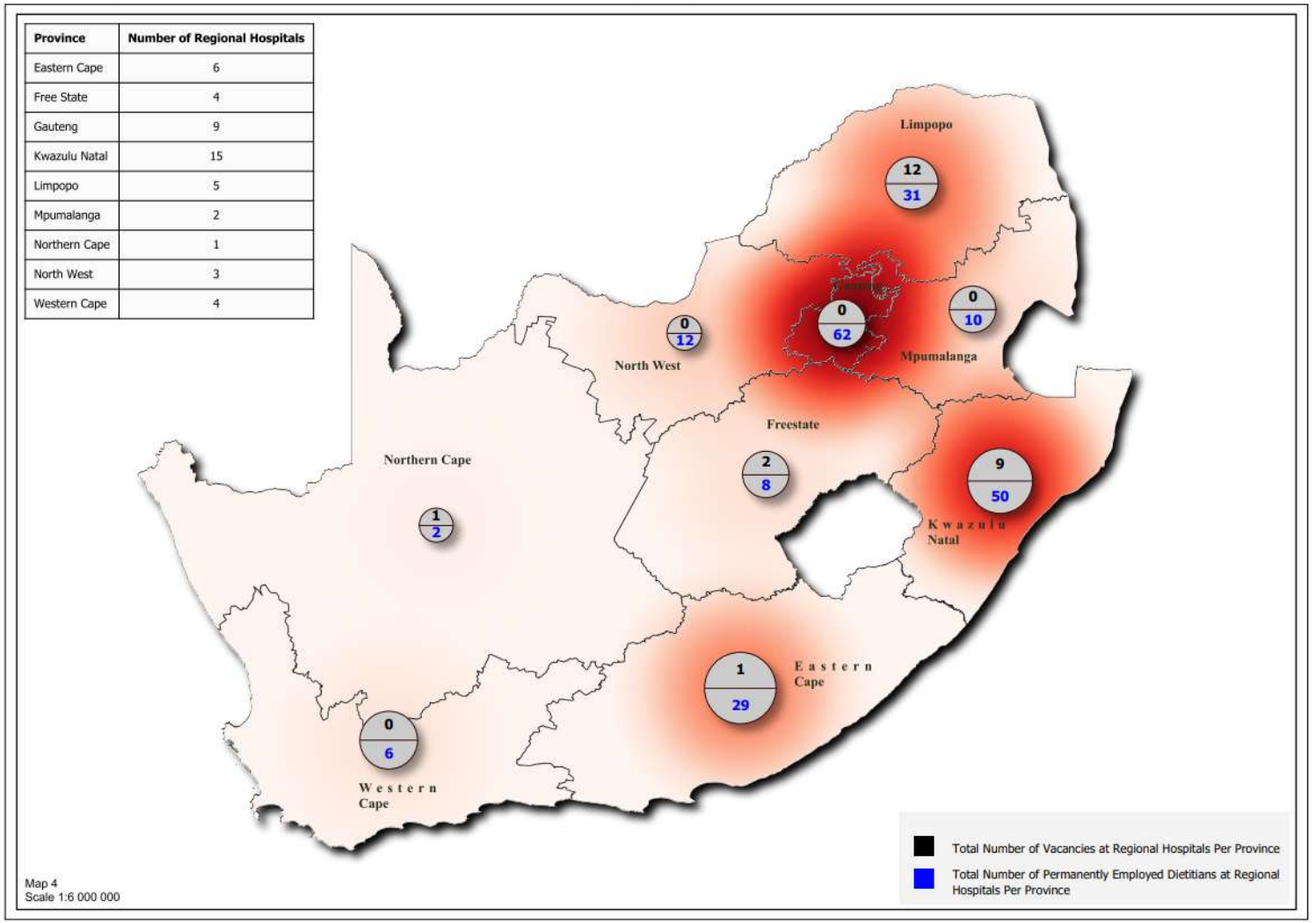

Figure 10. Distribution of Permanently Employed Dietitians Versus Total Vacancies at Regional Public Hospitals in South Africa.

DISTRIBUTION OF PERMANENTLY EMPLOYED DIETITIANS VERSUS TOTAL VACANCIES AT DISTRICT HOSPITALS IN SOUTH AFRICA

Province	Number of District Hospitals
Eastern Cape	56
Free State	25
Gauteng	14
Kwazulu Natal	37
Limpopo	30
Mpumalanga	24
Northern Cape	13
North West	11
Western Cape	33

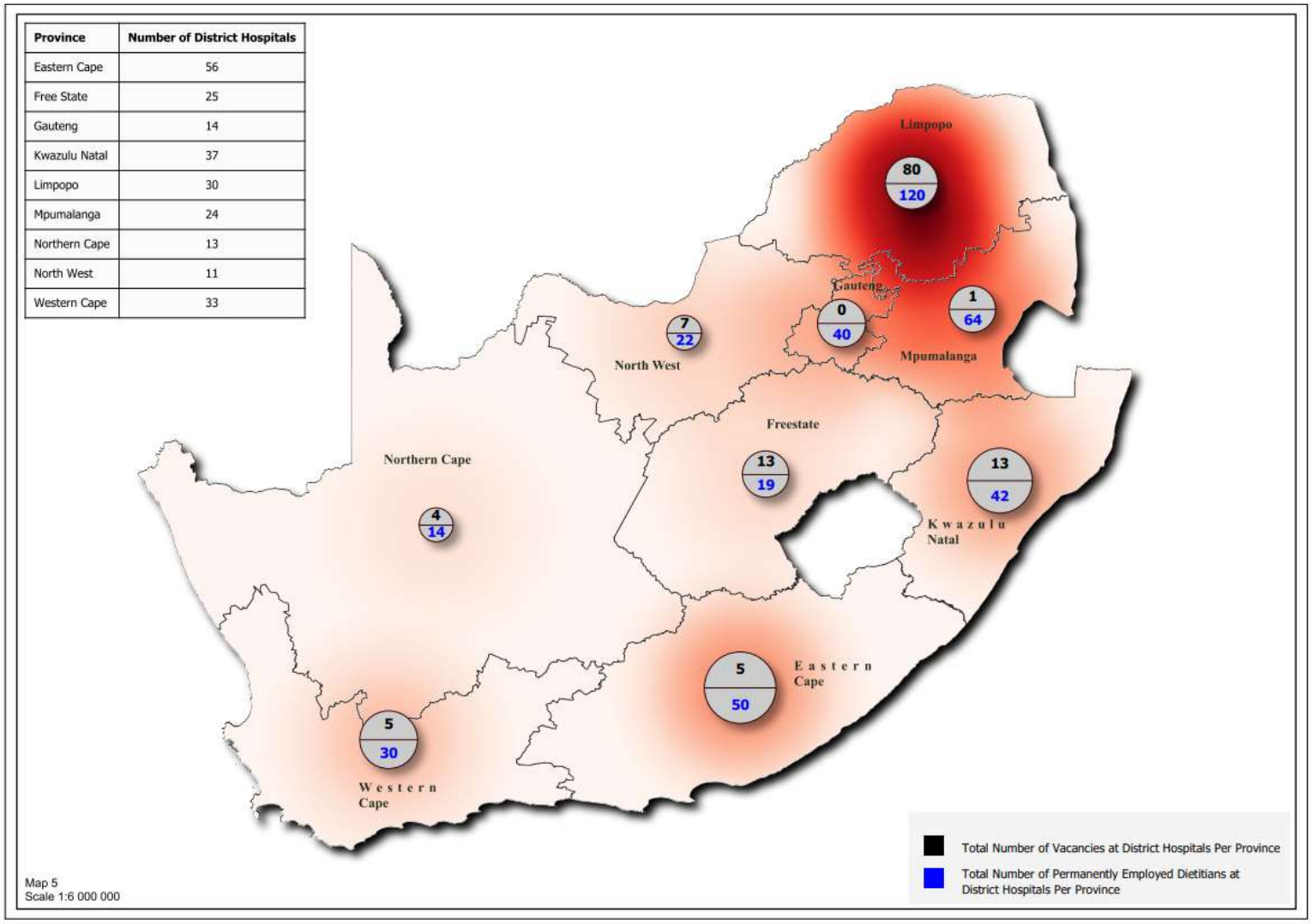

Figure 11. Distribution of Permanently Employed Dietitians Versus Total Vacancies at District Public Hospitals in South Africa.

DISTRIBUTION OF PERMANENTLY EMPLOYED DIETITIANS VERSUS TOTAL VACANCIES AT SPECIALISED HOSPITALS IN SOUTH AFRICA

Province	Number of Specialised Hospitals
Eastern Cape	10
Free State	1
Gauteng	6
Kwazulu Natal	8
Limpopo	4
Mpumalanga	4
Northern Cape	2
North West	2
Western Cape	9

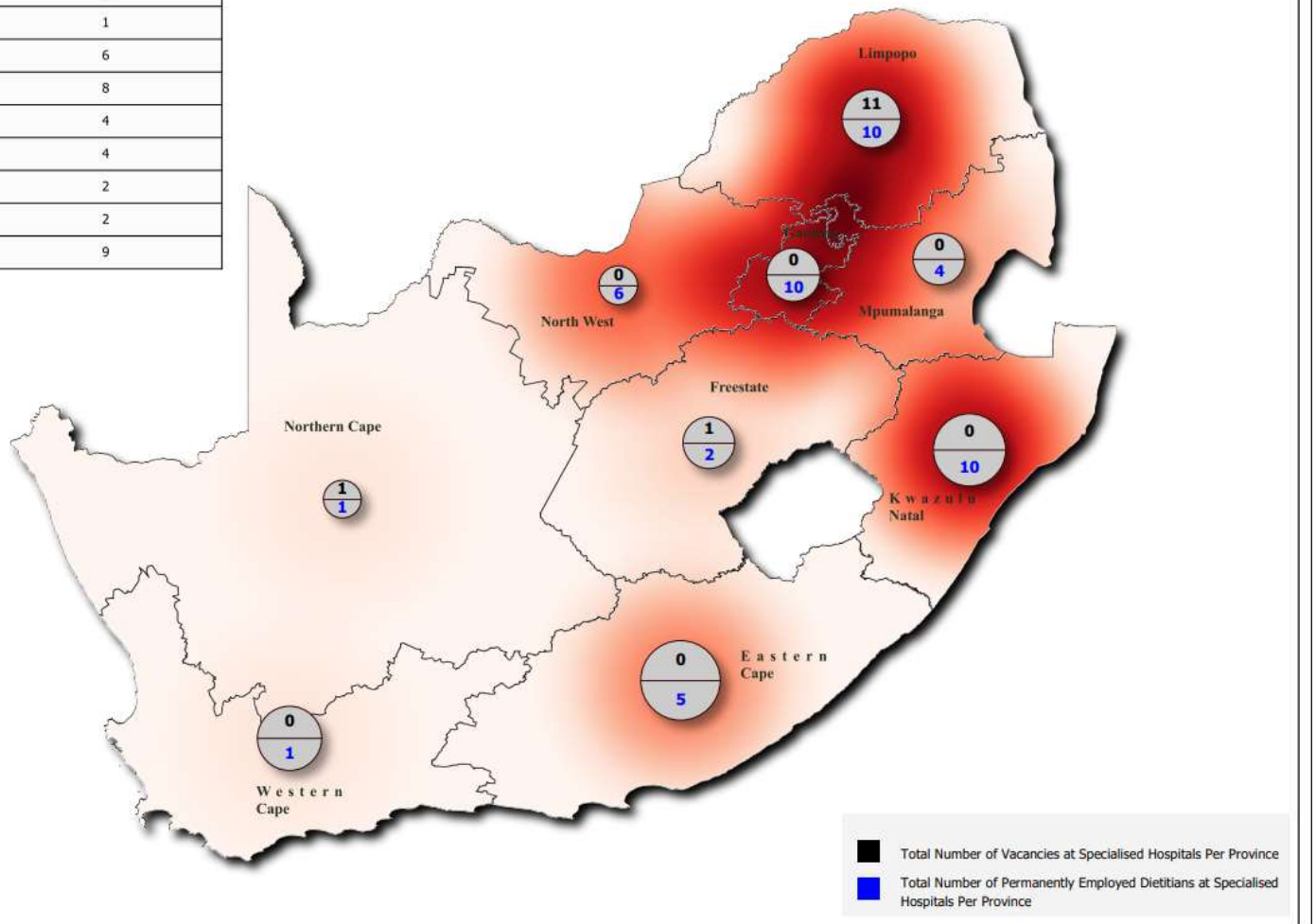

Figure 12. Distribution of Permanently Employed Dietitians Versus Total Vacancies at Specialised Public Hospitals in South Africa.

6.1.2 What are the current work activities of dietitians at a central and tertiary public hospital?

Whilst a baseline of the numbers of dietitians are important, it is just as important to determine the actual work activities performed. WISN indicates that workloads should be defined by considering the actual work done by the cadre under consideration.[1] However, yet again, it may be assumed that such data can easily be obtained through professional practice documents. However, dietitians in SA working under the auspices of the Health Professions Council of South Africa (HPCSA) are regulated by a scope of profession that dates back to 1991.[2] In addition, the Dietetics and Nutrition Board of the HPCSA, has not finalised a scope of practice for the cadre. Hence, job descriptions were used to determine a baseline of the work activities of dietitians at central and tertiary public hospital level. The outcomes of this exercise revealed the non-standardisation of job descriptions for the level of care. In addition, different formats, level of detail, and differences in key responsibilities were found between the various ranks of dietitians, across hospitals and provinces. Although this baseline data served useful in progressing to the next steps of WISN, it clearly outlined the need for a dietetic scope of practice in guiding the work activities of dietitians in hospitals.

6.2 Consensus: Let`s reach an agreement on the work activities of dietitians for the central and tertiary level of care

This consensus process is detailed in Chapter three submitted as a manuscript: *A Delphi Consensus Study to Determine the Workload Components and Activity Standards of Dietitians in South Africa`s Central and Tertiary Public Hospitals.*

Evidence based work force planning requires that each country develops their own context specific WC and AS, these cannot be adopted or adapted from one country to another.[3] Hence, this phase focussed on obtaining consensus of the actual work activities that dietitians perform daily at a central and tertiary public hospital level. This step was also critical in getting agreement on the baseline information obtained from the job descriptions.

To be nationally representative, this process required that 21 head dietitians from the nine provinces of SA be brought together to constitute a cadre-based expert group for the central and tertiary public hospital level. Literature indicates that the online Delphi technique has been used widely, in several disciplines due to its cost-effectiveness and convenience when dealing with incomplete knowledge in comparison to “traditional group meetings”.[4-7]

A panel of experts; an online platform for questionnaire distribution; sequential questionnaires; and guaranteed anonymity, enhanced the rigor and content validity of the study. Delphi also provided a quick and simple way to obtain data and guide group opinion towards consensus.[5, 6, 8] The exercise allowed for anonymity in responses, reduced bias and encouraged freedom of expression.[6, 8] The 100% participation of dietitians in all three concurrent rounds of the online Delphi, resulted in a 92% agreement rating on all proposed and newly added workload components, adding to the rigor and validity of this study.[7] A final total of 45 workload components (15 health, 15 support and 15 additional service activities) together with aligned activity standards was obtained. The standardisation of WC and AS provided proper insight into the actual work activities performed by dietitians at the central and tertiary level of care. The conclusion of this consensus phase (steps 3 and 4 of WISN) provided the necessary information to allow for progression into the finalisation phase of the study.

6.3 Finalisation: Getting some real answers to our questions and providing solutions

6.3.1 What are the actual staffing requirements of dietitians at central and tertiary public hospitals?

A case study was conducted using the data obtained in the consensus phase to calculate the staffing requirements of central and tertiary public hospitals based on the evidence-based WHO WISN workforce tool. A detailed account of the WISN based case study is provided in chapter four: *Application of the Workload Indicators of Staffing Need: A Case Study of the Dietetic Workforce at South African Central and Tertiary Public Hospitals*

The main aim of this case study was to apply the WHO WISN methodology in determining the actual staffing requirements of the 21 hospitals. The consensus phase proved useful in highlighting that dietitians performed many administrative activities that could essentially be performed by support staff. However, only nine out of the 21 hospitals utilised the services of support staff and all hospitals highlighted the need for the support cadre in reducing the workload of dietitians. Literature highlights the need to improve shortages of technical and administrative staff which can aid in obtaining an appropriate skill mix that can lessen the workload of dietitians.[9-11]

Hence, the researcher deduced that it would be useful for hospitals if these findings were reported in the form of three scenarios, taking into consideration support staff: Scenario 1) provided WISN requirements to meet ONLY health service activities; Scenario 2) Total WISN

requirements (health, support, and individual activities) with the assistance of support staff, and Scenario 3) Total WISN requirements (health, support, and individual activities) without the assistance of support staff. Ideally, all hospitals should essentially work towards total WISN requirements (scenario 2 or 3). However, scenario 1 was included to merely provide an indication of whether hospitals were meeting the basic needs of patients.

It was clear in all three scenarios, the workloads of dietitians varied between the hospitals based on the number of current dietetic staff, geographical location, and catchment populations. Hence, a key finding that the staffing needs of hospitals are indeed unique as they are based on health service statistics.[12] It must be noted that only eight out of the 21 hospitals provided complete statistics for all health service activities. Whilst this resulted in an underestimation of their staffing requirements, this data still provided the first step in revealing the actual dietetic needs of all hospitals.

Irrespective of the incomplete statistics, overall, the calculated WISN requirements still showed understaffing in 86% of hospitals for (Scenario 1), 95% of hospitals for Scenario 2 and 100% of hospitals for Scenario 3. Findings show that the assistance of support staff can almost half the total WISN requirement for dietitians. Proper task shifting of non-clinical activities to lower-level support staff can lessen the need for more dietitians than is actually required.[9] Therefore, scenario 2 provides the ideal basis to meet this requirement in ensuring adequate workforce planning. In addition, (10 out of 21) hospitals had a WISN calculated ratio of 0.5, illustrating an extremely high workload pressure for dietitians. Literature shows that the application of WISN in other countries have also shown similar trends in understaffing for several cadres within the health care setting.[13-17]

WISN workload calculations do not consider overtime, however, findings in this study have shown that 16 of the 21 hospitals performed overtime.[1] 15 of the 21 performed overtime over weekends and public holidays whilst 8 performed overtime on weekdays. There were contrasting views on the need for overtime. 17 of the 21 participants indicated the importance for overtime over weekends and public holidays to ensure service continuity. 4 of the 21 felt that overtime is not required, and assistance can be provided via standby or telephonically. Findings revealed the need to distinguish between standby, on-call and overtime services performed by dietitians as these were interpreted differently. Results also indicated that some hospitals did not have dietitians employed in managerial posts, leading to chief and production dietitians having to perform managerial duties. This often resulted in a higher workload for lower-level staff necessitating the need for overtime. The provision of overtime to compensate for staff shortages requires attention to assist in reducing workload pressures. Dietitians' have

expressed frustrations regarding the need to perform overtime for the completion of daily tasks because of high workloads, which may lead to possible burn out and lack of motivation.[11, 18]

Although, results indicate the need for an extremely high requirement for dietitians, it must be noted that recommendations from a previous study conducted in SA at the PHC level, emphasised the need for appropriate consultation with relevant stakeholders such as the Departments of National Treasury and Public Service to assist in planning towards a workforce that the country can afford.[19] A study conducted by Vafee-Najar et al has shown that even though there are increases in costs, the overall outcomes associated with workforce planning based on WISN in Iran, improved nurse and patient satisfaction and reduced the number of nurse resignations.[20]

WHO recommends the use of WISN as part of periodic reviews to allow for long-term forecasting of staffing needs.[1] These reviews make room for appropriate health and human resource planning to allow for the effective and efficient forecasting of staff.[11, 14, 21-23] Stankovic et al recommends the periodic review of WISN every two years to account for changes that may occur in the number of patients and the nature of activities conducted by the cadre.[21] Thus, this led to the second objective of the finalisation phase which then focussed on the development of a framework and user-friendly implementation tool to allow for these periodic reviews going forward.

6.3.2 What tools can be used to inform appropriate workforce planning at central and tertiary public hospitals in SA?

Literature emphasises the need for WISN to be repeated by facilities periodically to allow for the creation of staffing trends and appropriate forecasting, budgeting, and planning.[21] Having the necessary and user-friendly tools are essential in allowing for adequate implementation. Thus, this phase utilised the WHO WISN methodology to develop a staffing norm framework and SA implementation tool as discussed in Chapter five: A staffing norm framework and implementation tool for dietitians: a South African Workload Indicators of Staffing Need (WISN) study.

Figure 8 below depicts the contextualisation of the WHO WISN methodology into a SA staffing norm framework.[1] This guidance framework provides a stepwise approach to the implementation of WISN in SA. The framework has been contextualised only for dietitians in the SA central and tertiary public hospital context (step 1).

Step 2 provides guidance on the standardised Available Working Time (AWT) for the cadre as aligned to the South African Basic Conditions of Employment Act, 1997 (Act 75 of 1997)

(BCEA).[24] Steps 3 and 4, have been standardized based on the outcomes of the consensus phase. Up to this point the framework provides a standardized approach for dietitians at all central and tertiary public hospitals. However, the findings from the consensus phase show that the workloads of hospitals vary based on their health service statistics. Thus, from step 5 onwards the framework allows for the individual needs of hospitals by taking into consideration their health service statistics. Standard workloads (step 5) are dependent upon a facility`s health service statistics, thereafter, allowance factors (step 6) take into consideration both support and individual service activities. This results in the calculation of the WISN based staffing requirements (step 7). Finally, facilities can interpret their WISN results based on the levels of understaffing and staff work pressures.

Although the WISN manual provides formulae to assist in the calculation of WISN requirements, one may still require expert guidance to master these scientific calculations and ensure accuracy of the results obtained for appropriate implementation.[25] As a researcher, I sought the expertise of a WHO WISN expert to assist me in both understanding and conducting the calculations required. I now understand the level of detail required in doing the manual calculations versus the use of an automated tool. Hence, I felt that there was a need for an implementation tool to allow for user-friendliness.

Literature indicates a growing WISN user`s' community following the launch of the revised WHO WISN manual and automated software in 2010.[25] Automation of the WISN in some countries was highlighted as a key factor that eased its implementation ".[26] The WHO WISN software is a generic tool that can be used across countries, contexts, and cadres; thus, each facility or country is still required to standardise WC and AS for their own contexts.[25]

As a result, this study further aimed to develop a context specific automated tool based on the SA staffing norm framework to assist end-users with a tool that is user-friendly and allows for continuity. "The standardised data obtained from the study on WC, AS and AWT for dietitians at central and tertiary public hospitals (steps 1-4) helped to contextualise the WHO WISN methodology into a SA specific implementation tool. All formulae as per WHO WISN manual were then coded into the SA excel tool making WHO WISN the basis of the SA implementation tool[1]. The framework and implementation tool go hand in hand and accounts for variations in standard workloads, but also assists in meeting the individual and unique dietetic staffing needs of each hospital.[27] **(*This tool and the contents thereof remain the property of the developers and may not be used without their written permission.)***

A critical part of this developmental study aimed to validate the SA implementation tool against the WHO WISN software as a gold standard. Therefore, the same data loaded into the WHO WISN software from the case study (chapter 4) was also loaded into the SA excel tool. The

WHO WISN software calculated an average of 24.59 required dietitians per hospital, whilst the South African excel tool calculated this value at 24.23. On average, the WHO WISN software value and the South African excel tool value differed by 0.36, representing a percentage deviation of 1.46. This small percentage deviation suggests that the South African excel tool can be used in the South African context. Thus, making for a cadre and context specific tool that requires no expert knowledge on the actual calculations, and allowing for easy implementation.

6.4 Implications of the Study

There is currently no national staffing model or tool that exists to address the workforce challenges of South African dietitians, especially in the public hospital setting. Hence, this cadre and context specific staffing norm framework and implementation tool, allows for the appropriate planning and forecasting of South Africa`s central and tertiary public hospital dietitians. In addition, this study has also mapped a baseline of public hospital dietitians in South Africa, setting the stage for further research and the development of similar frameworks and tools for regional, district and specialised hospital levels.

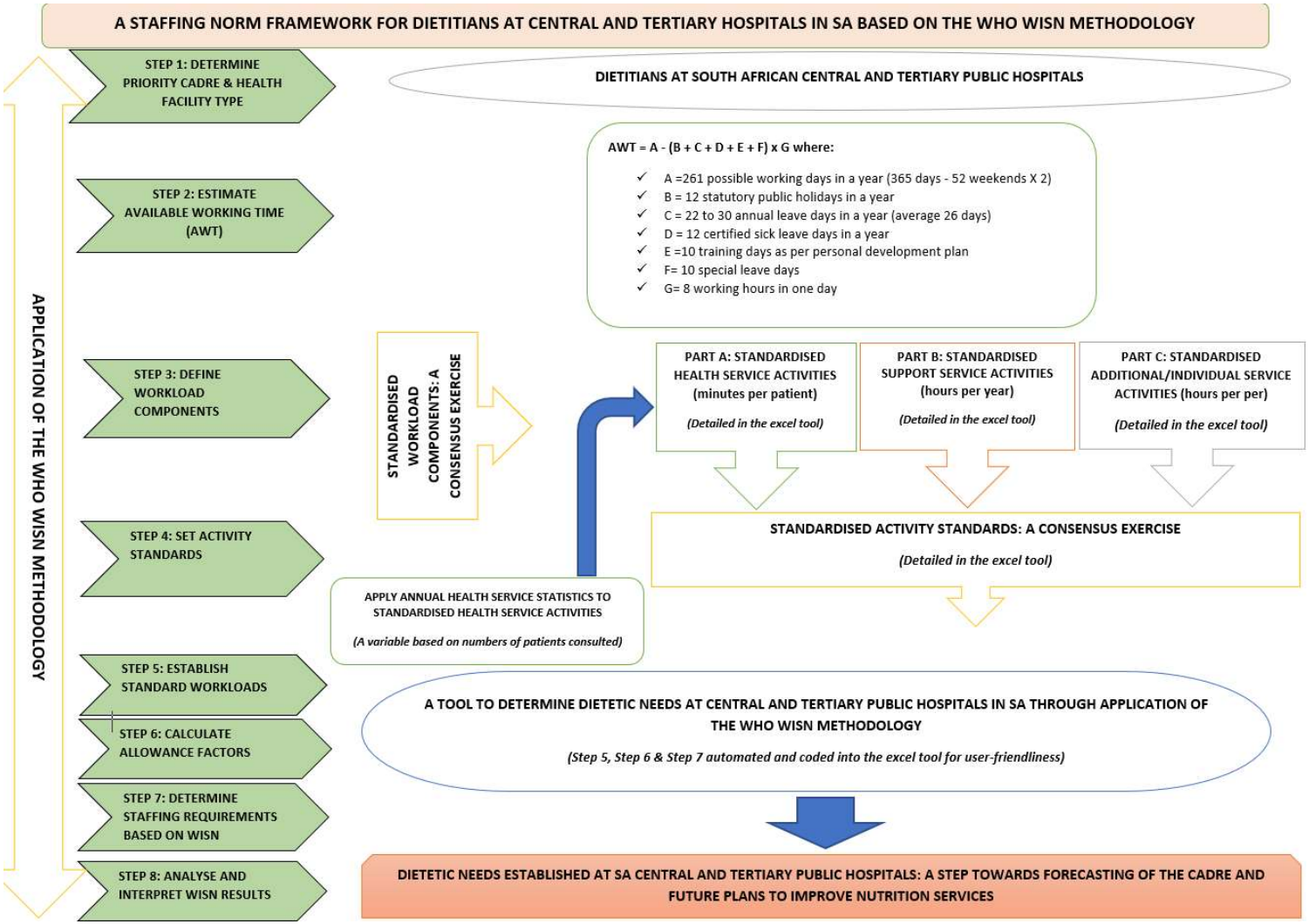

Figure 13. A WISN Based Staffing Norm Framework for Dietitians at South African Central and Tertiary Public Hospitals

6.5 Limitations of the study

Limitations of the study included issues with internet connectivity and in some cases limited access to computers, however the researcher accounted for this by providing telephonic interviews as required. Job descriptions were not standardised and therefore, some provided very detailed information whilst others only provided vague information. As, a result the dietetic expertise of the researcher was used to extract work activities as per the three categories of WC guided by the WISN manual.[1] This was then further explored by the expert group as part of the consensus phase. Despite there being no standardisation of JDs, there was a 92% agreement rating on all new and proposed WC as part of the consensus phase. Thus, indicating that there is indeed alignment in the actual work activities performed by dietitians at the central and tertiary level of care.

There was a disjuncture between the actual health service activities performed by dietitians and the related recording of such statistics. Whilst not all hospitals provided complete statistics, the results were still beneficial in showing levels of understaffing. However, better data collection could improve the accuracy of the calculated staffing requirements.

6.6 Conclusion

The study achieved its aim by mapping the distribution of hospital dietitians for the whole of the public hospital sector and as such has certainly set a baseline upon which future studies could be modelled. Thus, it is hoped that dietetic research on the staffing requirements at other levels of care will follow using similar methodology. This study has highlighted the benefits of the online Delphi technique as a suitable method in obtaining expert opinion and consensus amongst the dietetic cadre at SA central and tertiary public hospitals. Thus, the method can certainly assist in doing the same for other levels of hospitals and possibly other cadres. The automated WHO WISN tool was found to be both user-friendly and efficient in determining the WISN requirement for dietitians at SA central and tertiary public hospitals. The WISN tool has exposed the extreme levels of understaffing and workload pressures experienced by dietitians. This only highlights the urgency in prioritising the needs of the cadre. Although generic in nature, the WHO WISN methodology was found to be versatile in guiding the development of a staffing norm framework and implementation tool specifically for dietitians at SA central and tertiary public hospitals. It is hoped that this evidence-based staffing norm framework and implementation tool can now provide the necessary guidance required by policy makers and managers in periodically reviewing the staffing needs of dietitians. These

tools can serve as a basis for the prioritization, forecasting and planning of dietitians going forward.

6.7 Recommendations

Based on the results obtained from all three developmental phases of this study as discussed in the previous chapters, the following recommendations are presented:

6.7.1 Recommendations based on the study findings

- The standard workload components obtained from the consensus phase of this study can assist in the standardisation of job descriptions for dietitians at central and tertiary public hospitals.
- The standard set of workload components can also prove useful in guiding the collection of a standard set of health service statistics. It is only through the collection of appropriate health service statistics that one can determine appropriate staffing requirements.
- There is a need to further investigate and prioritise the role of support staff in reducing the workloads of dietitians.
- Managerial posts require prioritisation at central and tertiary public hospitals. Lower-level staff should not have to shoulder the responsibility of managerial duties.
- It is recommended that the concept of overtime is reviewed to determine its suitability for the dietetic cadre in the central and tertiary public hospital setting. Dietitians should not be performing overtime for the completion of daily activities.

6.7.2 Recommendations for future research

- There is a need for a national human resource database that provides updated information on the distribution of dietitians at all levels of the public health care sector. This data can allow for the appropriate planning and forecasting of dietitians at a macro-level.
- There is a need for a scope of practice for dietitians in South Africa that can assist in guiding the work practices of the cadre. This overall guidance must be provided by the regulating body.

- Further research is recommended for the development of workload components and activity standards for dietitians at all levels of care to assist in determining the staffing requirements at regional, district, specialised and Primary Health Care.
- Further research is recommended for the development of similar dietetic staffing norm frameworks and implementation tools that can be useful for other levels of care.

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APPENDICES

Appendix 1: Survey to obtain and confirm data on the current distribution of dietitians at South African public hospitals.

https://pretoria.eu.qualtrics.com/jfe/form/SV_6EbzUBOypfehITX

Dear Participant

Thank you for agreeing to participate in this online survey. This survey aims to obtain and confirm data required on the current distribution of dietitians at public hospitals in South Africa. It also, requires information on the job descriptions of dietitians based at central and tertiary hospitals. This data will assist in mapping the distribution of dietitians across South Africa and with the development of a staffing norm framework for dietitians at central and tertiary public hospitals.

Please only select the districts and hospitals that are relevant to your province. Please use the blank spaces to add other districts or hospitals that may have been omitted from the list. Please also assist by sending through job descriptions of the different levels of dietitians based ONLY at central and tertiary hospitals within your province. These job descriptions can be emailed directly to Ms Nolene Naicker using the email address nolene.naicker@health.gov.za.

The estimated timeframe for completion of the survey is approximately 30 minutes. You may complete the survey at your convenience. You will be given one month from the receipt of the survey to respond. Your time and effort taken to complete this survey is indeed most appreciated.

1. Please confirm the name of your province.

   Gauteng

2. Please indicate your designation at the Provincial Department of Health

- ○ Director: Nutrition
- ◉ Deputy Director: Nutrition
- ○ Assistant Director: Nutrition
- ○ Other

3. Please confirm the names of the districts in your province.

☐ Ekurhuleni

☐ Johannesburg

☐ Other 1

☐ Other 2

- [ ] Sedibeng
- [ ] Tshwane
- [ ] West Rand
- [ ] Other 3
- [ ] Other 4
- [ ] Other 5

4. Please confirm the hospitals in your province (This is an example if Gauteng was selected as the province in the previous question)

	Please select the level of hospital	Please select the number of permanently employed dietitians	Please select the number of vacant dietetic posts
Tembisa			
Bertha Gxowa			
Pholosong			
Other 1			
Other 2			

Please provide job descriptions for the following ranks of dietitians for each of the following central and tertiary hospitals in your province. Please select ranks for which job descriptions are available.

Please email copies of job descriptions to Ms Nolene Naicker at nolene.naicker@health.gov.za

	Deputy Director Available	Assistant Director Available	Chief Dietitian Available
Thembisa	○	○	○
Steve Biko	○	○	○
George Mukhari	○	○	○
Charlotte Maxeke	○	○	○

Please include any additional comments in the space provided:

We thank you for your time spent taking this survey.
Your response has been recorded.

Appendix 2: Pilot questionnaire to determine consensus on workload components and activity standards for dietitians at central and tertiary public hospitals in South Africa.
https://pretoria.eu.qualtrics.com/jfe/form/SV_9pmLnBe7aa2bEsC

Dear Participant

Thank you for agreeing to participate in this online survey.

This survey aims to obtain expert opinion and consensus on the proposed workload components and activity standards regarding work that dietitians at central and tertiary public hospitals in South Africa perform. This questionnaire will be followed by two to three rounds of questionnaires to ensure that consensus is obtained through adequate consultation. A fourth questionnaire will only be introduced should consensus not be reached by the third questionnaire.

QUESTIONNAIRE ONE: This questionnaire will explore the current workload components and propose workload components as per the obtained job descriptions of dietitians based at central and tertiary hospitals in South Africa. It will also seek to obtain other workload components and proposed activity standards from the expert group.

QUESTIONNAIRE TWO: This questionnaire will include all proposed workload components and proposed activity standards from questionnaire one and will seek to obtain any other additional workload components and activity standards that may have been omitted in the first questionnaire. It will also serve to explore participants agreement or disagreement on the workload components and Activity standards.

QUESTIONNAIRE THREE: This questionnaire will summarise all responses from the previous rounds and allow participants an opportunity to review their previous responses if required. It will also allow participants an opportunity to justify or substantiate all disagreements. Participants will be required to provide statistics related to the defined workload components and activity standards where applicable.

QUESTIONNAIRE FOUR: This questionnaire will only take place if consensus has not been reached by questionnaire three. Should there be a need for a fourth round then this questionnaire will only focus on workload components and activity standards that still require consensus. These workload components and activity standards will then serve as a foundation in developing a staffing norm framework for dietitians at central and tertiary public hospitals in South Africa.

DEFFINITION OF SOME IMPORTANT TERMS:

WORKLOAD COMPONENTS: Refers to the main work activities that take up most of a dietitians daily working time. There are three kinds of workload components included in this questionnaire represented as follows:

PART A: HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

PART B: SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

PART C: ADDITIONAL /INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

Please select your province from the list below

- Eastern Cape

- Free State
- Gauteng
- KwaZulu Natal
- Limpopo
- Mpumalanga
- Northern Cape
- North West
- Western Cape

Please select your hospital from the list below (This is an example based on the selection of the Eastern Cape province)

- Nelson Mandela Academic
- Frere
- Livingstone
- Other

Please indicate your designation at your hospital

- Deputy Director
- Assistant Director
- Chief Dietitian
- Production Dietitian
- Other

Please select your age category

- 20-29 years
- 30-39 years
- 40-49 years
- 50-59 years
- Over 60 years

Please indicate your total years of experience as a dietitian

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-20 years
- ○ 21-30 years
- ○ Over 30 years

PART A: HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

Below is a list of dietetic health activities. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

	Strongly Disagree	Disagree	Do not Agree/Disagree	Agree	Strongly Agree
Ward rounds (Individual and Multidisciplinary)	○	○	○	○	○
Patient screening	○	○	○	○	○
In patient consultation and treatment (new)	○	○	○	○	○
In Patient nutritional assessment (ABCDE) & diagnosis	○	○	○	○	○
In patient calculation of nutritional requirements and development of nutrition intervention plans	○	○	○	○	○
In patient nutrition support & dietary counselling	○	○	○	○	○
In patient consultation and treatment (FU)	○	○	○	○	○
In Patient referral, communication with the multidisciplinary team and related activities	○	○	○	○	○
Outpatient consultation and treatment (new)	○	○	○	○	○
Outpatient nutritional assessment (ABCDE) & diagnosis	○	○	○	○	○

	Strongly Disagree	Disagree	Do not Agree/Disagree	Agree	Strongly Agree
Outpatient nutritional plan and intervention including Dietary counselling	○	○	○	○	○
Outpatient consultation and treatment (FU)	○	○	○	○	○

Please add any other HEALTH ACTIVITIES that you think should be included. Please also indicate an activity standard for each health service activity added.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Click to write Column 1 Activity Standard
Add Health Service Activity	
Add Health Service Activity	
Add Health Service Activity	
Add Health Service Activity	

PART B: SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

Below is a list of dietetic support activities. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

	Strongly Disagree	Disagree	Do not Agree/Disagree	Agree	Strongly Agree
Ward rounds (Individual and Multidisciplinary)	○	○	○	○	○
Patient screening	○	○	○	○	○
In patient consultation and treatment (new)	○	○	○	○	○
In Patient nutritional assessment (ABCDE) & diagnosis	○	○	○	○	○
In patient calculation of nutritional requirements and development of nutrition intervention plans	○	○	○	○	○
In patient nutrition support & dietary counselling	○	○	○	○	○
In patient consultation and treatment (FU)	○	○	○	○	○
In Patient referral, communication with the multidisciplinary team and related activities	○	○	○	○	○
Outpatient consultation and treatment (new)	○	○	○	○	○
Outpatient nutritional assessment (ABCDE) & diagnosis	○	○	○	○	○
Outpatient nutritional plan and intervention including Dietary counselling	○	○	○	○	○
Outpatient consultation and treatment (FU)	○	○	○	○	○

Please add any other SUPPPORT ACTIVITIES that you think should be included. Please also indicate an activity standard for each support service activity added.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Click to write Column 1 Activity Standard
Add Support Service Activity	
Add Support Service Activity	
Add Support Service Activity	
Add Support Service Activity	
Add Support Service Activity	

PART C: ADDITIONAL /INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

Below is a list of dietetic individual/additional activities. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Managerial duties (risk management, planning of duty rosters)	◉	○	○	○	○
Financial management (Budgeting and procurement)	○	○	○	○	○
Asset management and physical resource management	○	○	○	○	○
Develop departmental plans (strategic, business, and operational)	○	○	○	○	○
Develop & Review policies/strategies/guidelines/protocols and norms and standards	○	○	○	○	○
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	○	○	○	○	○
Human Resource management (Grievances & disciplinary processes, HPCSA registration & compliance, attendance and leave register)	○	○	○	○	○
Recruitment, selection & appointment of new staff	○	○	○	○	○
Training, support & supervision of lower-level staff & community service dietitians	○	○	○	○	○
Performance Development and Management System (PMDS)	○	○	○	○	○
CPD activities	○	○	○	○	○
Report writing, validation and presentations	○	○	○	○	○
Participate in accreditation of facilities for students training	○	○	○	○	○
National Core standards (QIP)- Develop plans, evaluation & Reports	○	○	○	○	○
Planning and coordination of departmental meetings	○	○	○	○	○

Please add any other INDIVIDUAL/ADDITIONAL ACTIVITIES that you think should be included. Please also indicate an activity standard for each individual/additional service activity added.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Activity Standard
Add Individual Service Activity	
Add Individual Service Activity	
Add Individual Service Activity	
Add Individual Service Activity	
Add Individual Service Activity	

Thank you for the time taken and your assistance in completing this survey. Your efforts are most appreciated.

Feedback from this round will be provided in the form of a second questionnaire and will be sent to you within the next 2 to 3 weeks.

Your continued participation going forward will be greatly appreciated.

Please feel free to add any additional comments that you may have.

Appendix 3: Pilot questionnaire: evaluation form

Dear Participant,

Thank you for agreeing to participate in this pilot survey. This survey aims to obtain expert opinion and consensus on the proposed workload components and activity standards that dietitians perform at central and tertiary public hospitals in South Africa. This pilot survey will be followed by three to four rounds of questionnaires to ensure that consensus is obtained through adequate consultation. Please can you assist in evaluating the pilot questionnaire by answering the following questions. This evaluation will assist in refining the questionnaire in preparation for round one of the survey process. Your assistance and contribution to this research project is most appreciated. All responses received will be treated with utmost confidentiality.

1. ***Is the initial brief or overview of the study clear in introducing the study aims and objectives to the participants?***

AGREE ☐ ***DISAGREE*** ☐

If you disagree, then how can it be improved?

……
……
……

2. ***Is the questionnaire relevant for the target audience?***

AGREE ☐ ***DISAGREE*** ☐

If you disagree, then please indicate the alternate target audience that should be included?

……
……
……

3. ***Is the use of language and terminology clear and understandable to the participant?***

AGREE ☐ ***DISAGREE*** ☐

If you disagree then please indicate where and how this can be improved?

……
……
……

4. ***Are all questions phrased correctly?***

AGREE ☐ ***DISAGREE*** ☐

If you disagree, how can they be re-phrased? Please provide examples of the questions that should be re-phrased?

……
……
……

5. *Are there any other questions that should be added to the questionnaire?*

AGREE ☐ *DISAGREE* ☐

If you agree then please add examples of questions that should be added.

……
……
……

6. *Are there any questions that are irrelevant and should be left out of the survey?*

AGREE ☐ *DISAGREE* ☐

If you agree, then please indicate the questions that should be left out and reasons why.

……
……
……

7. *Is the questionnaire formatted in a user-friendly manner?*

AGREE ☐ *DISAGREE* ☐

If you disagree, then how can it be re-formatted to improve the user-friendliness?

……
……
……

8. *Is the length of the questionnaire adequate?*

AGREE ☐ *DISAGREE* ☐

If you disagree, then please indicate if it should it be shorter or longer? Please also indicate what can be done to change the length of the survey.

……
……
……

Appendix 4: Delphi Round One Questionnaire: To determine consensus on workload components and activity standards for dietitians at central and tertiary public hospitals in South Africa

https://pretoria.eu.qualtrics.com/jfe/form/SV_eKUvyF6CfIaBqNE

Dear Participant

Thank you for agreeing to participate in this online survey.

This survey aims to obtain expert opinion and consensus on the proposed workload components and activity standards regarding work that dietitians at central and tertiary public hospitals in South Africa perform. This questionnaire will be followed by two to three rounds of questionnaires to ensure that consensus is obtained through adequate consultation. A fourth questionnaire will only be introduced should consensus not be reached by the third questionnaire.

QUESTIONNAIRE ONE: This questionnaire will explore the current workload components and propose workload components as per the obtained job descriptions of dietitians based at central and tertiary hospitals in South Africa. It will also seek to obtain other workload components and proposed activity standards from the expert group.

QUESTIONNAIRE TWO: This questionnaire will include all proposed workload components and proposed activity standards from questionnaire one and will seek to obtain any other additional workload components and activity standards that may have been omitted in the first questionnaire. It will also serve to explore participants agreement or disagreement on the workload components and Activity standards.

QUESTIONNAIRE THREE: This questionnaire will summarise all responses from the previous rounds and allow participants an opportunity to review their previous responses if required. It will also allow participants an opportunity to justify or substantiate all disagreements. Participants will be required to provide statistics related to the defined workload components and activity standards where applicable.

QUESTIONNAIRE FOUR: This questionnaire will only take place if consensus has not been reached by questionnaire three. Should there be a need for a fourth round then this questionnaire will only focus on workload components and activity standards that still require consensus. These workload components and activity standards will then serve as a foundation in developing a staffing norm framework for dietitians at central and tertiary public hospitals in South Africa.

DEFFINITION OF SOME IMPORTANT TERMS:

WORKLOAD COMPONENTS: Refers to the main work activities that take up most of a dietitians daily working time. There are three kinds of workload components included in this questionnaire represented as follows:

PART A: HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

PART B: SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

PART C: ADDITIONAL /INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

Please select your province from the list below

- Eastern Cape
- Free State
- Gauteng
- KwaZulu Natal
- Limpopo
- Mpumalanga
- Northern Cape
- North West
- Western Cape

Please select your hospital from the list below

- Nelson Mandela Academic
- Frere
- Livingstone
- Other

Please indicate your designation at your hospital

- Deputy Director
- Assistant Director
- Chief Dietitian
- Production Dietitian
- Other

Please select your age category

- 20-29 years
- 30-39 years
- 40-49 years
- 50-59 years

- ○ Over 60 years

Please indicate your total years of experience as a dietitian

- ○ 1-5 years
- ○ 6-10 years
- ○ 11-20 years
- ○ 21-30 years
- ○ Over 30 years

PART A: HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

Below is a list of dietetic health activities. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

	Strongly Disagree	Disagree	Do not Agree/Disagree	Agree	Strongly Agree
Ward rounds (Individual and Multidisciplinary)	○	○	○	○	○
Patient screening	○	○	○	○	○
In patient consultation and treatment (new)	○	○	○	○	○
In Patient nutritional assessment (ABCDE) & diagnosis	○	○	○	○	○
In patient calculation of nutritional requirements and development of nutrition intervention plans	○	○	○	○	○
In patient nutrition support & dietary counselling	○	○	○	○	○
In patient consultation and treatment (FU)	○	○	○	○	○
In Patient referral, communication with the multidisciplinary team and related activities	○	○	○	○	○
Outpatient consultation and treatment (new)	○	○	○	○	○

	Strongly Disagree	Disagree	Do not Agree/Disagree	Agree	Strongly Agree
Outpatient nutritional assessment (ABCDE) & diagnosis	○	○	○	○	○
Outpatient nutritional plan and intervention including Dietary counselling	○	○	○	○	○
Outpatient consultation and treatment (FU)	○	○	○	○	○

- Please add any other HEALTH ACTIVITIES that you think should be included. Please also indicate an activity standard for each health service activity added.

- ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Click to write Column 1 Activity Standard
Add Health Service Activity	
Add Health Service Activity	
Add Health Service Activity	
Add Health Service Activity	
Add Health Service Activity	

PART B: SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

Below is a list of dietetic support activities. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Administrative functions related to ordering of specialized diets and therapeutic nutrition (PN & EN)	○	○	○	○	○
Monitor Wastage and Usage of PN and EN	○	○	○	○	○
Food Service Management (developing and updating of therapeutic diets and related diet sheets)	○	○	○	○	○
Monitor food service rendered by out-sourced company	○	○	○	○	○
Participation in journal reviews and working groups	○	○	○	○	○
Dietetic Departmental Meetings	○	○	○	○	○
Meetings with industry representatives and other external stakeholders	○	○	○	○	○
Own Performance Development and Management System (PMDS) reporting	○	○	○	○	○
CPD Activities	○	○	○	○	○
Orientation of new staff	○	○	○	○	○
In-service Training to the multidisciplinary team and food service team	○	○	○	○	○
Students mentoring (training), evaluation and reporting (including meetings with universities)	○	○	○	○	○
Attend training (Generic)	○	○	○	○	○

Please add any other SUPPPORT ACTIVITIES that you think should be included. Please also indicate an activity standard for each support service activity added.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Click to write Column 1 Activity Standard
Add Support Service Activity	
Add Support Service Activity	
Add Support Service Activity	
Add Support Service Activity	
Add Support Service Activity	

PART C: ADDITIONAL /INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

Below is a list of dietetic individual/additional activities. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree
Managerial duties (risk management, planning of duty rosters)	◉	○	○	○	○
Financial management (Budgeting and procurement)	○	○	○	○	○
Asset management and physical resource management	○	○	○	○	○
Develop departmental plans (strategic, business, and operational)	○	○	○	○	○
Develop & Review policies/strategies/guidelines/protocols and norms and standards	○	○	○	○	○
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	○	○	○	○	○
Human Resource management (Grievances & disciplinary processes, HPCSA registration & compliance, attendance and leave register)	○	○	○	○	○
Recruitment, selection & appointment of new staff	○	○	○	○	○
Training, support & supervision of lower-level staff & community service dietitians	○	○	○	○	○
Performance Development and Management System (PMDS)	○	○	○	○	○
CPD activities	○	○	○	○	○
Report writing, validation and presentations	○	○	○	○	○
Participate in accreditation of facilities for students training	○	○	○	○	○
National Core standards (QIP)- Develop plans, evaluation & Reports	○	○	○	○	○
Planning and coordination of departmental meetings	○	○	○	○	○

Please add any other INDIVIDUAL/ADDITIONAL ACTIVITIES that you think should be included. Please also indicate an activity standard for each individual/additional service activity added.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Activity Standard
Add Individual Service Activity	
Add Individual Service Activity	
Add Individual Service Activity	
Add Individual Service Activity	
Add Individual Service Activity	

Thank you for the time taken and your assistance in completing this survey. Your efforts are most appreciated.

Feedback from this round will be provided in the form of a second questionnaire and will be sent to you within the next 2 to 3 weeks.

Your continued participation going forward will be greatly appreciated.

Please feel free to add any additional comments that you may have.

Appendix 5: Delphi Round Two Questionnaire: To determine consensus on workload components and activity standards for dietitians at central and tertiary public hospitals in South Africa

https://pretoria.eu.qualtrics.com/jfe/form/SV_1EUMxGMMrsw2IGq

Dear Participant

Thank you for agreeing to participate in this survey and thank you for your participation and contributions made already in questionnaire one. Your contributions in questionnaire one has been beneficial in assisting towards the preparation of this second questionnaire.

The following information below is just a reminder of what the different rounds will entail so that you know what to expect following this round.

This study survey aims to obtain expert opinion and consensus on the proposed workload components and activity standards regarding work that dietitians at central and tertiary public hospitals in South Africa perform. There will be three rounds of questionnaires to ensure that consensus is obtained through adequate consultation. A fourth questionnaire will only be introduced should consensus not be reached by the third questionnaire.

QUESTIONNAIRE ONE: This questionnaire explored the current workload components and proposed workload components as per the obtained job descriptions of dietitians based at central and tertiary hospitals in South Africa. We also tried to obtain other workload components and proposed activity standards from the expert group.

QUESTIONNAIRE TWO: This questionnaire will now include all proposed workload components and proposed activity standards from questionnaire one and will seek to obtain any other additional workload components and activity standards that may have been omitted in the first questionnaire. It will also serve to explore participants agreement or disagreement on the workload components and Activity standards. Statistics will be gathered here on all agreed workload components obtained in the first questionnaire.

QUESTIONNAIRE THREE: This questionnaire will summarise all responses from the previous rounds and allow participants an opportunity to review their previous responses if required. It will also allow participants an opportunity to justify or substantiate all disagreements. Participants will be required to provide statistics related to the defined workload components and activity standards where applicable.

QUESTIONNAIRE FOUR: This questionnaire will only take place if consensus has not been reached by questionnaire three. Should there be a need for a fourth round then this questionnaire will only focus on workload components and activity standards that still require consensus. These workload components and activity standards will then serve as a foundation in developing a staffing norm framework for dietitians at central and tertiary public hospitals in South Africa.

DEFINITION OF SOME IMPORTANT TERMS:
Please do pay special attention to these definitions to ensure that the current workload components and any new proposed workload components are allocated to the correct category listed below as Parts A, B and C. Incorrect allocations can/may affect calculations of total workload later in the process.

WORKLOAD COMPONENTS: Refers to the main work activities that take up most of a dietitian daily working time. There are three kinds of workload components included in this questionnaire represented as follows:

PART A: HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

PART B: SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

PART C: ADDITIONAL /INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.
General Information:

This first section covers a few general questions related to numbers of dietitians, vacancies, ranks, sessional dietitians, support staff and overtime so that this can also be taken into consideration if required at a later stage.

Please confirm the number of permanently employed dietitians at your hospital in COLUMN ONE with any available vacancies in COLUMN TWO (these should exclude community service dietitians).

Please allocate these numbers as per the ranks listed below:

	Number of dietitians employed Column One	Number of vacancies Column Two
Deputy Director		
Assistant Director		
Chief Dietitian		
Production Dietitian		

Do you currently have any dietetic support staff?

Please indicate your response below with either a `yes` or `no'. If you selected yes, then please elaborate in the text box below yes (type of staff, how many, are they sufficient?)

- ○ No
- ○ Yes

Do you have sessional dietitians at your hospital?

If you selected yes, then please indicate their work hours in the text box provided under `yes`.

- ○ No
- ○ Yes

Do you perform overtime at your hospital?

If yes, then please indicate how often and for how long in the text box provided under `yes`. Example 1 hour a day or 8 hrs per month etc

- ○ No
- ○ Yes

PART A: HEALTH SERVICE ACTIVITIES:

These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

The following activities are a summarised list of all health service activities that received a more than 70% agreement rating by participants in the first round. This is important for your noting as these will now be retained, and we will only work on activities that were not agreed upon and new proposed activities from the round one going forward in this questionnaire.

AGREED UPON HEALTH SERVICE ACTIVITIES FROM QUESTIONAIRE ONE

Health Service Activities	Strongly Agree (%)	Agree (%)
Ward Rounds (individual & Multidisciplinary	95.24	4.76
Patient Screening	71.43	14.29
In Patient Consultation and Treatment (New)	100	0
In Patient Nutritional Assessment (ABCDE) & diagnosis	100	0
In Patient Calculation of Nutritional Requirements & development of nutrition intervention plans	95.24	4.76
In Patient Nutrition Support and Dietary Counselling	95.24	4.76
In Patient Consultation and Treatment (FU).	95.24	4.76
In Patient Referral, communication with the multidisciplinary team and related activities	90.48	9.52
Outpatient Consultation and Treatment (New).	80.95	19.05
Outpatient Nutritional Assessment (ABCDE) & Diagnosis	85.71	14.29
Outpatient Nutritional Plan and Intervention including dietary counselling	85.71	14.29

Based on the above agreement status, please can you assist in now allocating an activity standard for each of these agreed upon health service activities in COLUMN ONE below.

Please be reminded of the following definition:
ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

In addition, please can you also add annual health service statistics for each health service activity in COLUMN TWO below. These are usually the total number of patients/clients per health service activity per facility per year. Thus, please can you provide health service statistics only for the period: January 2021 to December 2021.

	Activity Standard Column One	Health Service Statistics Column Two
Ward Rounds (individual and Multidisciplinary)		
Patient Screening		
In Patient Consultation and Treatment (New)		
In Patient Nutritional Assessment (ABCDE) & diagnosis		
In Patient Calculation of Nutritional Requirements & development of nutrition intervention plans		
In Patient Nutrition Support and Dietary Counselling		
In Patient Consultation and Treatment (FU)		
In Patient Referral, communication with the multidisciplinary team and related activities		
Outpatient Consultation and Treatment (New)		
Outpatient Nutritional Assessment (ABCDE) & Diagnosis		
Outpatient Nutritional Plan and Intervention including dietary counselling		

PART A CONTINUED:

HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

Please find below new Health Service Activities proposed by participants in round one. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

If you have selected either Strongly Agree or Agree for any of the Health Service Activities listed below, then please also insert an activity standard in the TEXT BOX directly below each Health Service Activity.

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
Outpatient Consultation	○	○	○	○	○
Outpatient Follow-up	○	○	○	○	○
Outpatient /Specialist Clinics (Cerebral palsy, Diabetes etc)	○	○	○	○	○
Patient Assessment and Follow-up over Weekends	○	○	○	○	○
Report Writing and Patient Notes	○	○	○	○	○
Referral process including writing of letters (between health facilities)	○	○	○	○	○

Please feel free to add any further comments you may have related to Part A: Health Service Activities.

PART B: SUPPORT ACTIVITIES:

These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

The following activities are a summarised list of all support service activities that received a more than 70% agreement rating by participants in questionnaire one.

This is important for your noting as these will now be retained, and we will only work on support activities that were not agreed upon and new proposed support activities from round one going forward in this questionnaire.

AGREED UPON SUPPORT ACTIVITIES FROM QUESTIONAIRE ONE

Support Service Activities	Strongly Agree (%)	Agree (%)
Administrative Functions related to Ordering of	81.0	14.0

Specialised Diets and Therapeutic Nutrition (PN & EN)		
Monitor Wastage and Usage of PN and EN	76.0	19.0
Food Service Management (Developing and Updating of Therapeutic Diets & Related Diet Sheets	57.0	29.0
Participation in Journal Reviews and Working Groups	76.0	10.0
Dietetics Departmental Meetings	86.0	14.0
Meetings with Industry Representatives and other Stakeholders	52.0	43.0
Own Performance Development and Management System (PMDS) Reporting	90.0	10.0
CPD Activities	81.0	19.0
Orientation of New Staff	76.0	24.0
Students Mentoring (training), evaluation & Reporting (Including meeting with universities)	71.0	24.0
Attend Training (Generic)	76.0	19.0
Recordkeeping and Statistics	86.0	14.0
Peer Reviews and Clinical Audits	81.0	14.0
Development and Review of Policies, protocols, and Guidelines (Including related ECD materials)	76.0	19.0

Based on the above agreement status, please can you assist in now allocating an activity standard for each of these agreed upon support service activities in COLUMN ONE below.

Please be reminded of the following definition:

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

	Activity Standard Column One
Administrative Functions related to Ordering of Specialised Diets and Therapeutic Nutrition (PN & EN)	
Monitor Wastage and Usage of PN and EN	
Food Service Management (Developing and Updating of Therapeutic Diets & Related Diet Sheets)	
Participation in Journal Reviews and Working Groups	
Dietetics Departmental Meetings	
Meetings with Industry Representatives and other Stakeholders	
Own Performance Development and Management System (PMDS) Reporting	
CPD Activities	
Orientation of New Staff	
Students Mentoring (training), evaluation & Reporting (Including meeting with universities)	
Attend Training (Generic)	
Recordkeeping and Statistics	
Peer Reviews and Clinical Audits	
Development and Review of Policies, protocols and Guidelines (Including related ECD materials)	

PART B CONTINUED:

SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

Please find below new Support Activities proposed by participants in round one. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

If you have selected either Strongly Agree or Agree for any of the new support activities listed below, then please also insert an activity standard in the TEXT BOX directly below each support activity.

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
Outpatient Health Awareness Events/Campaigns/Open Days (planning and participation)	○	○	○	○	○
In-Service Training to the Multidisciplinary Team (Nurses, Doctors etc)	○	○	○	○	○
In-Service Training to the Food Service Team	○	○	○	○	○
Dietetic Administrative functions (telephone calls, emails, booking appointments, photocopying etc)	○	○	○	○	○
Patient Administration (patient handover, home care plans, recipes etc)	○	○	○	○	○
Hospital Committee/ Internal stakeholder meetings	○	○	○	○	○
Report Writing (patient reports, medico-legal reports etc)	○	○	○	○	○
The procurement process (Ordering, receiving & monitoring of enteral feeds)	○	○	○	○	○
Monitor and Audit Foodservices (In house or	○	○	○	○	○

Please feel free to add any further comments you may have to Part B: Support Activities.

PART C: ADDITIONAL/INDIVIDUAL ACTIVITIES:

These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

The following activities are a summarised list of all additional/individual activities that received a more than 70% agreement rating by participants in questionnaire one.

This is important for your noting as these will now be retained, and we will only work on additional/individual activities that were not agreed upon and new proposed additional/individual activities from round one going forward in this questionnaire.

AGREED UPON ADDITIONAL/INDIVIDUAL ACTIVITIES FROM QUESTIONAIRE ONE

Additional/Individual Service Activities	Strongly Agree (%)	Agree (%)
Managerial Duties (Risk Management, planning of Duty Rosters)	86.0	14.0
Financial Management (Budgeting and Procurement)	76.0	24.0
Asset Management and Physical Resource Management	67.0	24.0
Develop and Review Policies/Strategies/Guidelines/Protocols and Norms and Standards	76.0	24.0
Evaluate and Monitor the Implementation of Policies/Strategies/Guidelines/Protocols and Norms and Standards	71.0	24.0
Human Resource Management (Grievances and Disciplinary processes, HPCSA registration & compliance, attendance and leave register)	86.0	5.0
Recruitment, selection, and Appointment of new staff	81.0	19.0
Training, support and supervision of lower-level staff and community service dietitians	90.0	5.0
Performance Development and Management System (PMDS)	90.0	10.0
CPD Activities	81.0	19.0
Report Writing, Validations and Presentations	67.0	29.0
Participation in accreditation of facilities for student training	48.0	38.0
National Core Standards (QIP)-Develop plans, evaluation and reports	62.0	33.0
Planning and Coordination of Departmental Meetings	76.0	24.0
District, Provincial INP and Allied Meetings	76.0	10.0
Participation in Research Activities	57.0	33.0
Food Service Management, Development and Costing of Therapeutic Diets (Cycle menus, menu analyses, standardise recipes)	52.0	29.0
Education, Training and Supervision Foodservice/Diet Kitchen Staff/Milk Kitchen/Tube Feed Personnel	67.0	10.0
Generate Reports (meals, incidents, infection control)	43.0	29.0

	Activity Standard Column One
Managerial Duties (Risk Management, planning of Duty Rosters)	
Financial Management (Budgeting and Procurement)	
Asset Management and Physical Resource Management	
Develop and Review Policies/Startegies/Guidelines/Protocols and Norms and Standards	
Evaluate and Monitor the Implementation of Policies/Strategies/Guidelines/Protocols and Norms and Standards	
Human Resource Management (Grievances and Disciplinary processes, HPCSA registration & compliance, attendance and leave register)	
Recruitment, selection and Appointment of new staff	
Training, support and supervision of lower level staff and community service dietitians	
Performance Development and Management System (PMDS)	
CPD Activities	
Report Writing, Validations and Presentations	
Participation in accreditation of facilities for student training	
National Core Standards (QIP)-Develop plans, evaluation and reports	
Planning and Coordination of Departmental Meetings	
District, Provincial INP and Allied Meetings	
Participation in Research Activities	
Food Service Management, Development and Costing of Therapeutic Diets (Cycle menus, menu analyses, standardise recipes)	
Education, Training and Supervision of Foodservice/Diet Kitchen Staff/Milk Kitchen/Tube Feed Personnel	
Generate Reports (meals, incidents, infection control)	

Based on the above agreement status, please can you assist in now allocating an activity standard for each of these agreed upon additional/individual activities in COLUMN ONE below.

Please be reminded of the following definition:

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

PART C CONTINUED:

ADDITIONAL/INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

Please find below new Additional/Individual Activities proposed by participants in round one. Please indicate on the scale below to what extent you agree or disagree that they are applicable to the central or tertiary setting.

If you have selected either a Strongly Agree or Agree for any of the new additional/individual activities listed below, then please also insert an activity standard in the TEXT BOX directly below each additional/individual activity.

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
Outreach Activities	○	○	○	○	○
Hospital Committee/ Internal stakeholder meetings	○	○	○	○	○
Mother Baby Friendly Initiative (MBFI) mentor/committee participation and activities	○	○	○	○	○
Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	○	○	○	○	○
Stock Take of enteral feeds and supplements	○	○	○	○	○
Develop and Review Departmental Plans	○	○	○	○	○

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
(Strategic, Business and Operational)					
Asset Management and Physical Resource Management (including dietetic related equipment monitoring, repair and monitoring)					

Please feel free to add any further comments you may have related to Part C: Additional/Individual Activities

Thank you for the time taken and your assistance in completing questionnaire two of this survey. Your efforts are most appreciated.

Feedback from this round will be provided in the form of a third questionnaire and will be sent to you within the next 2 to 3 weeks.

Your continued participation going forward will be greatly appreciated.

Please feel free to add any general/additional comments that you may have.

Appendix 6: Delphi Round Three Questionnaire: To determine consensus on workload components and activity standards for dietitians at central and tertiary public hospitals in South Africa

https://pretoria.eu.qualtrics.com/jfe/form/SV_87ynooKwDbBEwxU

Dear Participant

Thank you for agreeing to participate in this survey and for your participation and contributions made already in questionnaire one and two. Your contributions in the first two questionnaires have been beneficial in assisting towards the preparation of this third questionnaire.

The following information below is just a reminder of what the different rounds entail so that you know what to expect following this round.

This study survey aims to obtain expert opinion and consensus on the proposed workload components and activity standards regarding work that dietitians at central and tertiary public hospitals in South Africa perform. There will be three rounds of questionnaires to ensure that consensus is obtained through adequate consultation. A fourth questionnaire will only be introduced should consensus not be reached by the third questionnaire.

QUESTIONNAIRE ONE: This questionnaire explored the current workload components and proposed workload components as per the obtained job descriptions of dietitians based at central and tertiary hospitals in South Africa. We also tried to obtain other workload components and proposed activity standards from the expert group.

QUESTIONNAIRE TWO: This questionnaire included all proposed workload components and proposed activity standards from questionnaire one and explored any other additional workload components and activity standards that may have been omitted in the first questionnaire. It also served to explore participants agreement or disagreement on the workload components and Activity standards. Health service statistics was gathered on all agreed health service workload components obtained in the first questionnaire.

QUESTIONNAIRE THREE: This questionnaire will now summarise all responses from the previous rounds and allow participants an opportunity to review their previous responses if required. It will also allow participants an opportunity to justify or substantiate all disagreements. Participants will be required to provide statistics related to the remaining defined health service workload components that were not covered in questionnaire two.

QUESTIONNAIRE FOUR: This questionnaire will only take place if consensus has not been reached by questionnaire three.

DEFINITION OF SOME IMPORTANT TERMS:

Please do pay special attention to these definitions to ensure that the current workload components and any new proposed workload components are allocated to the correct category listed below as Parts A, B and C. Incorrect allocations can/may affect calculations of total workload later in the process.

WORKLOAD COMPONENTS: Refers to the main work activities that take up most of a dietitians daily working time. There are three kinds of workload components included in this questionnaire represented as follows:

PART A: HEALTH SERVICE ACTIVITIES: These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

PART B: SUPPORT ACTIVITIES: These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

PART C: ADDITIONAL /INDIVIDUAL ACTIVITIES: These refer to activities performed only by certain dietitians (not all) and for which annual statistics are not regularly collected.

ACTIVITY STANDARDS: Refers to the time necessary for a well-trained, skilled, and motivated dietitian to perform an activity to professional standards in the local circumstances. Example 1 hour per week OR 10 minutes per patient OR 2 hours per quarter depending on the Workload Component.

Please type in the full name of your hospital in the text box below:

Support Staff

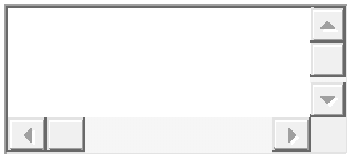
In the last round there were mixed responses regarding support staff. Therefore, there is a need to pose this question again for clarity.

It must noted that dietetic support staff excludes community service dietitians, covid contract dietitians or any staff member with a dietetic qualification.

It is gathered though that many facilities feel the need to have dietetic support staff. Please can you

indicate your responses to the following questions in the text box below:

1. What level of qualification do you think dietetic support staff should have and why?
2. What activities do you feel dietetic support staff can perform in helping to reduce the workload of dietitians?

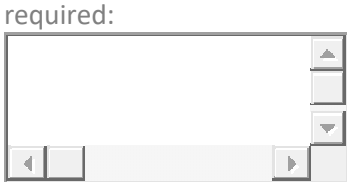


Overtime:

67% of responses in the last round indicated that overtime is performed at their hospitals. Can you please indicate yes or no to the following responses and elaborate in the text box where required?

	Column One YES or NO
Do you perform overtime at your hospital?	
Do you perform overtime on week days?	
Do you perform overtime on weekends?	
Do you perform overtime on public holidays?	
Are you remunerated for overtime?	
On average how many hrs of overtime do you perform per week?	
Do you feel that dietitians at a central or tertiary hospital should be performing overtime?	

Please feel free to comment further or explain some of your responses above regarding overtime if required:



PART A:

HEALTH SERVICE ACTIVITIES:

These refer to activities performed by all dietitians and for which annual statistics are regularly collected.

The table below summarises the list of all health service activities that received more than/equal to a 70% agreement rating by participants in the first two rounds.

The activity standard for each health service activity is reflected in minutes per patient per day. These activity standards are based on the Median of the data obtained from the previous round.

Health Service Activities (≥70% agreement)	Activity Standard Based on the Median
Ward Rounds (individual and Multidisciplinary)	10 minutes per patient
Patient Screening	5 minutes per patient
In Patient Consultation and Treatment (New)	30 minutes per patient
In Patient Nutritional Assessment (ABCDE) & diagnosis (New)	15 minutes per patient
In Patient Calculation of Nutritional Requirements & development of nutrition intervention plans (New)	15 minutes per patient
In Patient Nutrition Support and Dietary Counseling (New)	30 minutes per patient
In Patient Consultation and Treatment (FU)	15 minutes per patient
In Patient Referral, communication with the multidisciplinary team and related activities	10 minutes per patient
Outpatient Consultation and Treatment (New)	45 minutes per patient
Outpatient Nutritional Assessment (ABCDE) & Diagnosis (New)	15 minutes per patient
Outpatient Nutritional Plan and Intervention including dietary counseling (New)	30 minutes per patient
Outpatient Consultation and Treatment (FU)	30 minutes per patient
Outpatient /Specialist Clinics (Cerebral palsy, Diabetes etc)	45 minutes per patient
Report Writing and Patient Notes	15 minutes per patient
Referral process including writing of letters (between health facilities)	10 minutes per patient

This is a final review of the above set of health service activities and activity standards. Should there be any concerns at this stage then please feel free to indicate these in the text box below:

The following health service activities were agreed upon in the last round. Please provide health service statistics for the remaining health service activities below.

These should be reflected as the number of patients or clients seen during the period January to December 2021 for each health service activity listed below (example 1100 patients).

	Column One Health Service Statistics (Number of clients/patients)
Outpatient Consultation and Treatment (FU)	
Outpatient/Specialist Clinics (cerebral palsy, Diabetes etc)	
Report Writing and Patient Notes	
Referral process including writing of letters (between facilities)	

Please indicate the average length of stay for inpatients at your hospital?

The below health service activity was proposed to you in the last round. However, consensus was not obtained on this activity. This activity is being put forward again for review and finalisation.

Please indicate on the scale below to what extent you agree or disagree that this activity is applicable to the central or tertiary setting:

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
Patient Assessment and Follow-Up over Weekend	○	○	○	○	○

Please substantiate/explain your above response for Patient Assessment and Follow-Up over Weekends:

In addition, if you perform this health service activity at your facility then please provide health service statistics for this activity (Number of clients/patients seen during the period January to December 2021):

PART B:

SUPPORT SERVICE ACTIVITIES:

These refer to important activities that support health service activities, performed by all dietitians but for which annual statistics are not regularly collected.

The table below summarises the list of all support service activities that received more than/equal to a 70% agreement rating by participants in the first two rounds.

The activity standard for each support service activity is reflected in hrs per annum per dietitian. These activity standards are based on the Median of the data obtained in the previous round.

Support Activities (≥70% agreement)	Activity Standards based on the Median
Administrative Functions related to Ordering of Specialised Diets and Therapeutic Nutrition (PN & EN)	96 hours per annum per dietitian
Monitor Wastage and Usage of PN and EN	48 hours per annum per dietitian
Food Service Management (Developing and Updating of Therapeutic Diets & Related Diet Sheets)	24 hours per annum per dietitian
Development and Review of Policies, protocols and Guidelines (Including related ECD materials)	36 hours per annum per dietitian
Dietetic Administrative functions (telephone calls, emails, booking appointments, photocopying etc)	191 hours per annum per dietitian
The procurement process (Ordering, receiving & monitoring of enteral feeds)	137.5 hours per annum per dietitian
Dietetics Departmental Meetings	38 hours per annum per dietitian
Hospital Committee/ Internal stakeholder meetings	44 hours per annum per dietitian
Meetings with Industry Representatives and other external Stakeholders	18 hours per annum per dietitain
Own Performance Development and Management System (PMDS) Reporting	8 hours per annum per dietitian
CPD Activities	24 hours per annum per dietitian
Participation in Journal Reviews and Working Groups	38 hours per annum per dietitian
Orientation of New Staff	24 hours per annum per dietitian
In-Service Training to the Multidisciplinary Team (Nurses, Doctors etc)	12 hours per annum per dietitian
In-Service Training to the Food Service Team	8 hours per annum per dietitian
Students Mentoring (training), evaluation & Reporting (Including meeting with universities)	90 hours per annum per dietitian
Attend Training (Generic)	18 hours per annum per dietitain
Recordkeeping and Statistics	48 hours per annum per dietitian
Peer Reviews and Clinical Audits	24 hours per annum per dietitian
Patient Administration (patient handover, home care plans, recipes etc)	153 hours per annum per dietitian
Report Writing (patient reports, medico-legal reports etc)	38 hours per annum per dietitian
Outpatient Health Awareness Events/Campaigns/Open Days (planning and participation)	20 hours per annum per dietitain

This is a final review of the above set of support service activities and activity standards. Should there be any concerns at this stage then please feel free to indicate these in the text box below:

The below support service activity was proposed to you in the last round. However, consensus was not obtained on this activity. This activity is being put forward again for review and finalisation.

Please indicate on the scale below to what extent you agree or disagree that this activity is applicable to the central or tertiary setting:

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
Monitor and Audit Food Services (In house or outsourced as applicable)	○	○	○	○	○

Please substantiate/explain your above response for Monitor and Audit Food Services (in house or outsourced as applicable)

PART C:
INDIVIDUAL/ADDITIONAL SERVICE ACTIVITIES:
These refer to activities performed by certain dietitians (not all) and for which annual statistics are not regularly collected.

The table below summarises the list of all individual/additional service activities that received more than/equal to a 70% agreement rating by participants in the first two rounds.

The activity standard for each individual/additional service activity is reflected in hrs per annum per dietitian. These activity standards are based on the Median of the data obtained in the previous round.

Individual/Additional Activities (≥70% agreement)	Activity Standards Based on the Median
Managerial Duties (Risk Management, planning of Duty Rosters)	24 hours per annum per dietitian
Financial Management (Budgeting and Procurement)	24 hours per annum per dietitian
Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	24 hours per annum per dietitian
Stock Take of enteral feeds and supplements	57 hours per annum per dietitian
Asset Management and Physical Resource Management (including dietetic related equipment monitoring and repair monitoring)	24 hours per annum per dietitian
Develop and Review Departmental Plans (Strategic, Business and Operational)	16 hours per annum per dietitian
Develop and Review Policies/Strategies/Guidelines/Protocols and Norms and Standards	24 hours per annum per dietitian
Evaluate and Monitor the Implementation of Policies/Strategies/Guidelines/Protocols and Norms and Standards	24 hours per annum per dietitian
Report Writing, Validations and Presentations	36 hours per annum per dietitain
Human Resource Management (Grieviances and Disciplinary processes, HPCSA registration & compliance, attendance and leave register)	48 hours per annum per dietitian
Recruitment, selection and Appointment of new staff	16 hours per annum per dietitian
Training, support and supervision of lower level staff and community service dietitians	191 hours per annum per dietitian
Performance Development and Management System (PMDS)	20 hours per annum per dietitian
CPD Activities	24 hours per annum per dietitian
Participation in Research Activities	24 hours per annum per dietitian
Participation in accreditation of facilities for student training	8 hours per annum per dietitian
National Core Standards (QIP)-Develop plans, evaluation and reports	19 hours per annum per dietitian
Planning and Coordination of Departmental Meetings	36 hours per annum per dietitian
District, Provincial INP and Allied Meetings	24 hours per annum per dietitian
Hospital Committee/ Internal stakeholder meetings	38 hours per annum per dietitian
MBFI mentor/committee participation and activities	24 hours per annum per dietitian
Food Service Management, Development and Costing of Therapeutic Diets (Cycle menus, menu analyses, standardise recipes)	16 hours per annum per dietitian
Education, Training and Supervision of Foodservice/Diet Kitchen Staff/Milk Kitchen/Tube Feed Personnel	53 hours per annum per dietitian
Generate Reports (meals, incidents, infection control)	37 hours per annum per dietitian

This is a final review of the above set of individual/additional service activities and activity standards. Should there be any concerns at this stage then please feel free to indicate these in the text box below:

Individual/Additional Service Activities are only performed by certain dietitians and not all. Therefore, please indicate the number of dietitians that perform the following individual/ additional activities at your hospital:

	Column One Number of Dietitians
Managerial Duties (Risk Management, planning of Duty Rosters)	
Financial Management (Budgeting and Procurement)	
Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	
Stock Take of enteral feeds and supplements	
Asset Management and Physical Resource Management (including dietetic related equipment monitoring and repair monitoring)	
Develop and Review Departmental Plans (Strategic, Business and Operational)	
Develop and Review Policies/Strategies/Guidelines/Protocols and Norms and Standards	
Evaluate and Monitor the Implementation of Policies/Strategies/Guidelines/Protocols and Norms and Standards	
Report Writing, Validations and Presentations	
Human Resource Management (Grieviances and Disciplinary processes, HPCSA registration & compliance, attendance and leave register)	
Recruitment, selection and Appointment of new staff	
Training, support and supervision of lower level staff and community service dietitians	

	Column One Number of Dietitians
Performance Development and Management System (PMDS)	
CPD Activities	
Participation in Research Activities	
Participation in accreditation of facilities for student training	
National Core Standards (QIP)-Develop plans, evaluation and reports	
Planning and Coordination of Departmental Meetings	
District, Provincial INP and Allied Meetings	
Hospital Committee/ Internal stakeholder meetings	
MBFI mentor/committee participation and activities	
Food Service Management, Development and Costing of Therapeutic Diets (Cycle menus, menu analyses, standardise recipes)	
Education, Training and Supervision of Foodservice/Diet Kitchen Staff/Milk Kitchen/Tube Feed Personnel	
Generate Reports (meals, incidents, infection control)	
Outreach activities (community or lower-level hospitals)	

The below individual/additional service activity was proposed to you in the last round. However, consensus was not obtained on this activity. This activity is being put forward again for review and finalisation.

Please indicate on the scale below to what extent you agree or disagree that this activity is applicable to the central or tertiary setting:

	Strongly Disagree	Disagree	Do Not Agree/Disagree	Agree	Strongly Agree
Outreach activities (community or lower-level hospitals)	○	○	○	○	○

Please substantiate/explain your above response for Outreach activities (community or lower-level hospitals):

Thank you for the time taken and your assistance in completing questionnaire three of this survey. Your efforts are most appreciated.

Feedback from this round will be provided in the form of a fourth questionnaire only if this is found to be required.

Your continued participation going forward will be greatly appreciated.

Please feel free to add any general/additional comments that you may have.

Appendix 7: Information and informed consent document for provincial nutrition managers.

STUDY TITLE: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

Sponsor: N/A

Study Supervisor: Dr Heather Sedibe

Principal Investigators: Vertharani Nolene Naicker

Institution: University of Pretoria

DAYTIME AND AFTER-HOURS TELEPHONE NUMBER(S):

Daytime number/s: 060 9619415

Afterhours number: 060 9619415

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

23	**August**	**2021**	**: Sent via email**
date	**month**	**year**	**Time**

Dear Prospective Participant

Dear Prof/Dr/ Mr /Mrs/Ms. .....

1) INTRODUCTION

As a PHD student registered with the University of Pretoria, Department of Human Nutrition, I would like to kindly request your informed consent to participate in my study. The information in this document serves to help you to decide if you would like to participate. Before you agree to take part in this study you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the principal investigator. You should not agree to take part unless you are completely happy about all the procedures involved. You may also feel free to refer this invitation to any other individual that you feel may be relevant for the study or if you are unable to do so.

2) THE NATURE AND PURPOSE OF THIS STUDY

The aim of this study is to develop a staffing norm framework for dietitians in South African central and tertiary public hospitals. This process will involve assessing the current distribution profile of dietitians at South African public hospitals, to assess the existing job descriptions of dietitians at central and tertiary level hospitals and a survey to gain expert opinion on dietetic workload components and activity standards.

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS.

This study involves participation in an online survey. The online survey will help to determine information on the current distribution of dietitians at public hospitals in your province and to obtain job descriptions of dietitians at central and tertiary public hospitals. The survey will be done in the form of an online questionnaire. It will include only one questionnaire using the Qualtrics tool. All consenting participants will be sent an online questionnaire and given a reasonable timeframe for completion. All participants will remain anonymous throughout the study. No personal information of participants will be included in the study. All responses will only be used specifically for the aims of the study.

4) POSSIBLE RISKS AND DISCOMFORTS INVOLVED

There are no medical, personal or professional risks associated with the study.

5) POSSIBLE BENEFITS OF THIS STUDY

As a participant representing your provincial nutrition department your participation and expertise is beneficial in assisting to determine the current distribution of dietitians within your province at all public hospitals and in obtaining job descriptions of dietitians for only central and tertiary public hospitals in South Africa. The study results will help us to develop a staffing norm framework for dietitians at central and tertiary public hospitals in South Africa. This may further assist in standardizing these norms in South Africa and serves to assist in the planning and forecasting of dietetic staff at this level and may ultimately assist in improving the quality of dietetic services overall.

6) COMPENSATION

You will not be paid to take part in the study. However, it must be noted that your efforts and time taken to participate is most appreciated.

7) YOUR RIGHTS AS A RESEARCH PARTICIPANT

Your participation in this study is entirely voluntary and you can refuse to participate or stop at any time without stating any reason. You may also nominate another representative (with their consent) should you feel that someone else may be more appropriate or if you are unable to participate for any given reason.

8) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. A copy of the Declaration may be obtained from the investigator should you wish to review it.

9) INFORMATION

If I have any questions concerning this study, I should contact:

Ms Vertharani Nolene Naicker. cell: 060 9619415

10) CONFIDENTIALITY

All information obtained during this study will be regarded as confidential. Each participant that is taking part will be provided with an alphanumeric coded number e.g. A001. This will ensure confidentiality of information so collected. Only the researcher will be able to identify you as a participant. Results will be published or presented in such a fashion that all responses remain confidential. The records will be kept in a password secured disk.

11) CONSENT TO PARTICIPATE IN THIS STUDY

- I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I am aware that the information obtained in the study, will be anonymously processed and presented in the reporting of results.
- I understand that I will not be penalized in any way should I wish to discontinue with the study and that withdrawal will not affect my further work.
- I am participating willingly.
- I have received a signed copy of this informed consent agreement.

_____

Participant's name (Please print)

_____ _____

Participant's signature **Date**

Researcher's name (Please print)

_____ _____

Researcher's signature **Date**

Appendix 8: Information and informed consent document for heads of dietetic departments (dietitians) at central and tertiary public hospitals

STUDY TITLE: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

Sponsor: N/A

Study Supervisor: Dr Heather Sedibe

Principal Investigators: Vertharani Nolene Naicker

Institution: University of Pretoria

DAYTIME AND AFTER-HOURS TELEPHONE NUMBER(S):

Daytime number/s: 060 9619415

Afterhours number: 060 9619415

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

			:	
date	Month	year	Time	

Dear Prospective Participant

Dear Prof/Dr/ Mr /Mrs/Ms. .....

1) INTRODUCTION

As a PHD student registered with the University of Pretoria, Department of Human Nutrition, I would like to kindly request your informed consent to participate in my study. This information in this document serves to help you to decide if you would like to participate. Before you agree to take part in this study you should fully understand what is involved. If you have any questions, which are not fully explained in this document, do not hesitate to ask the principal investigator. You should not agree to take part unless you are completely happy about all the procedures involved. You may also feel free to refer this invitation to any other individual that you feel may be relevant for the study or if you are unable to do so.

2) THE NATURE AND PURPOSE OF THIS STUDY

The aim of this study is to develop a staffing norm framework for dietitians in South African central and tertiary level hospitals. This process will involve assessing the current distribution profile of dietitians at

South African public hospitals, to compare the existing job descriptions of dietitians at central and tertiary hospitals and a survey to gain expert opinion on dietetic workload components and activity standards.

3) EXPLANATION OF PROCEDURES AND WHAT WILL BE EXPECTED FROM PARTICIPANTS.

This study involves participation in an online survey to determine dietetic workload components and activity standards for central and tertiary public hospitals. These workload components and activity standards will assist with the development of a staffing norm framework for central and tertiary public hospitals. The survey will be done in the form of an online questionnaire. It will include between one to four rounds of questionnaires using the Qualtrics tool until consensus is reached by majority of the participant group. All consenting participants will be sent a series of one to four online questionnaires and given a reasonable timeframe for completion. All participants will remain anonymous throughout the study. No personal information of participants will be included in the study. All responses will only be used specifically for the aims of the study.

4) POSSIBLE RISKS AND DISCOMFORTS INVOLVED

There are no medical, personal or professional risks associated with the study.

5) POSSIBLE BENEFITS OF THIS STUDY

As a participant representing a public health central/tertiary level hospital your participation and expertise is beneficial in assisting to determine standardized dietetic workload components and activity standards at central/tertiary level public health hospitals across South Africa. The study results will help us to develop a staffing norm framework for dietitians at central/tertiary level public health hospitals in South Africa. This may further assist in standardizing these norms in South Africa and serves to assist in the planning and forecasting of dietetic staff at this level and may ultimately assist in improving the quality of dietetic services overall.

6) COMPENSATION

You will not be paid to take part in the study. However, it must be noted that your efforts and time taken to participate is most appreciated.

7) YOUR RIGHTS AS A RESEARCH PARTICIPANT

Your participation in this study is entirely voluntary and you can refuse to participate or stop at any time without stating any reason. You may also nominate another representative (with their consent) should you feel that someone else may be more appropriate or if you are unable to participate for any given reason.

8) ETHICS APPROVAL

This Protocol was submitted to the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, telephone numbers 012 356 3084 / 012 356 3085 and written approval has been granted by that committee. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. A copy of the Declaration may be obtained from the investigator should you wish to review it.

9) INFORMATION

If I have any questions concerning this study, I should contact:

Ms Vertharani Nolene Naicker. cell: 060 9619415

10) CONFIDENTIALITY

All information obtained during this study will be regarded as confidential. Each participant that is taking part will be provided with an alphanumeric coded number e.g. A001. This will ensure confidentiality of information so collected. Only the researcher will be able to identify you as a participant. Results will be published or presented in such a fashion that all responses remain confidential. Records will be kept by the researcher in a password secured disk.

11) CONSENT TO PARTICIPATE IN THIS STUDY

- I confirm that the person requesting my consent to take part in this study has told me about the nature and process, any risks or discomforts, and the benefits of the study.
- I have also received, read and understood the above written information about the study.
- I have had adequate time to ask questions and I have no objections to participate in this study.
- I am aware that the information obtained in the study, will be anonymously processed and presented in the reporting of results.
- I understand that I will not be penalized in any way should I wish to discontinue with the study and that withdrawal will not affect my further work.
- I am participating willingly.
- I have received a signed copy of this informed consent agreement.

_____ _____

Participant's name (Please print) Date

_____ _____

Participant's signature Date

_____ _____

Researcher's name (Please print) Date

_____ _____

Researcher's signature Date

Appendix 9: Ethical Clearance Certificates and Renewal

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IORG #: IORG0001762 OMB No. 0990-0279 Approved for use through February 28, 2022 and Expires: 03/04/2023.

6 April 2021

Approval Certificate
New Application

Ethics Reference No.: 97/2021
Title: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

Dear Mrs V Naicker

The **New Application** as supported by documents received between 2021-02-26 and 2021-03-31 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2021-03-31 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Ethics Approval is valid for 1 year and needs to be renewed annually by 2022-04-06.
- Please remember to use your protocol number (97/2021) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further 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.

This is approval of phase I of the study. For phase II, submit the questionnaire (once ready) as an amendment to the study, with an explanatory cover letter, please.

We wish you the best with your research.

Yours sincerely

Professor Werdie (CW) Van Staden
MBChB MMed(Psych) MD FCPsych(SA) FTCL UPLM
***Chairperson**: Faculty of Health Sciences Research Ethics Committee*

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

Research Ethics Committee
Room 4-60, Level 4, Tswelopele Building
University of Pretoria, Private Bag x323
Gezina 0031, South Africa
Tel +27 (0)12 356 3084
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www.up.ac.za

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.
- FWA 00002567, Approved dd 22 May 2002 and Expires 03/20/2022.
- IORG #: IORG0001762. OMB No. 0990-0279 Approved for use through February 28, 2022 and Expires: 03/04/2023.

Faculty of Health Sciences **Research Ethics Committee**

19 January 2022

Approval Certificate
Amendment

Dear Mrs V Naicker,

Ethics Reference No.: 97/2021 – Line 1
Title: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

The **Amendment** as supported by documents received between 2021-12-07 and 2022-01-19 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2022-01-19 as resolved by its quorate meeting.

Please note the following about your ethics approval:
- Please remember to use your protocol number (97/2021) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further 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.

We wish you the best with your research.

Yours sincerely

On behalf of the FHS REC, Dr R Sommers
MBChB, MMed (Int), MPharmMed, PhD
Deputy Chairperson *of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria*

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

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Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 18 March 2022 and Expires 18 March 2027.
- IORG #: IORG0001762 OMB No. 0990-0278 Approved for use through August 31, 2023.

Faculty of Health Sciences **Research Ethics Committee**

20 May 2022

Approval Certificate
Annual Renewal

Dear Mrs V Naicker,

Ethics Reference No.: 97/2021 – Line 2
Title: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

The **Annual Renewal** as supported by documents received between 2022-04-14 and 2022-05-20 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2022-05-20 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2023-05-20.
- Please remember to use your protocol number (97/2021) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further 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.

We wish you the best with your research.

Yours sincerely

On behalf of the FHS REC, Dr R Sommers
MBChB, MMed (Int), MPharmMed, PhD
Deputy Chairperson *of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria*

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

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UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Health Sciences

Institution: The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federal wide Assurance.

- FWA 00002567, Approved dd 18 March 2022 and Expires 18 March 2027.
- IORG #: IORG0001762 OMB No. 0990-0278 Approved for use through August 31, 2023.

Faculty of Health Sciences **Research Ethics Committee**

18 May 2023

Approval Certificate
Annual Renewal

Dear Mrs V Naicker,

Ethics Reference No.: 97/2021 – Line 3
Title: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

The **Annual Renewal** as supported by documents received between 2023-04-19 and 2023-05-17 for your research, was approved by the Faculty of Health Sciences Research Ethics Committee on 2023-05-17 as resolved by its quorate meeting.

Please note the following about your ethics approval:

- Renewal of ethics approval is valid for 1 year, subsequent annual renewal will become due on 2024-05-18.
- Please remember to use your protocol number (97/2021) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further 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.

We wish you the best with your research.

Yours sincerely

On behalf of the FHS REC, Dr R Sommers
MBChB, MMed (Int), MPharmMed, PhD
Deputy Chairperson *of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria*

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health)

Research Ethics Committee
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Email: deepeka.behari@up.ac.za
www.up.ac.za

Fakulteit Gesondheidswetenskappe
Lefapha la Disaense tša Maphelo

Appendix 10: Provincial and Hospital Research Committee Approvals as Applicable on the National Health Research Database

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

DIRECTORATE:
Health Research & Knowledge Management Unit

Postal Address: Private Bag X9051
Physical Address: 330 Langalibalele Str, PM Burg, 3201
Tel: 0333953189/3123/2805 Fax: 033-3943782
Email address: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

NHRD Ref: KZ_202104_026

Dear Mrs N Naicker
(UP)

Approval of research

1. The research proposal titled **'DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS'** was reviewed by the KwaZulu-Natal Department of Health (KZN-DoH).

   The proposal is hereby **approved** for research to be undertaken at Inkosi Albert Luthuli Central and Greys hospitals.

2. You are requested to take note of the following:

   a. *All research conducted in KwaZulu-Natal must comply with government regulations relating to Covid-19. These include but are not limited to: regulations concerning social distancing, the wearing of personal protective equipment, and limitations on meetings and social gatherings.*
   b. *Kindly liaise with the facility manager BEFORE your research begins in order to ensure that conditions in the facility are conducive to the conduct of your research. These include, but are not limited to, an assurance that the numbers of patients attending the facility are sufficient to support your sample size requirements, and that the space and physical infrastructure of the facility can accommodate the research team and any additional equipment required for the research.*
   c. *Please ensure that you provide your letter of ethics re-certification to this unit, when the current approval expires.*
   d. *Provide an interim progress report and final report (electronic and hard copies) when your research is complete to **HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200** and e-mail an electronic copy to hrkm@kznhealth.gov.za*
   e. *Please note that the Department of Health shall not be held liable for any injury that occurs as a result of this study.*

For any additional information please contact Ms G Khumalo on 033-395 3189.

Yours Sincerely

Dr E Lutge
Chairperson, Health Research Committee
Date: 25/05/21.

GROWING KWAZULU-NATAL TOGETHER

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA
Private Bag X 9001, Pietermaritzburg, 3200
201 Town Bush Road, Northern Park, Pietermaritzburg, 3201
Tel: 0338973321 Fax: 0338973398
GREY'S HOSPITAL
OFFICE OF THE CEO

To:	**Ms. Vertharani Nolene Naicker** **Nutrition Directorate, National Department of Health**
From:	**Dr. K. B. Bilenge** **CEO - Greys Hospital**
Date:	**10 May 2021**
Re:	**Request for permission to conduct research at Grey's Hospital:** ***Development of a staffing norm framework for Dieticians at South African central and tertiary public hospitals***

Dear Ms. Naicker

Your request to conduct research at Grey's Hospital refers.
Permission to conduct the above study is hereby granted under the following conditions:

- You are required to obtain approval for your study from the Provincial Department of Health KZN Health Research Unit **prior to commencement**. You will find more information at: *http://www.kznhealth.gov.za/hrkm.htm*. Once obtained, please submit a copy;
- Confidentiality of hospital information, including staff and patient medical and/or contact information, must be kept at all times;
- **You are to ensure that your data collection process will not interfere with the routine services at the hospital. Of note, our dietetics department is operating under severe staffing constraints, so if our HoD of Dietetics or her staff are at any stage unable to participate in your study, you are requested to accept their decision;**
- You will not be provided with copies of job descriptions of **existing staff** for the purposes of your research, but templates of standardized job descriptions may be provided;
- You are to ensure that hospital resources are not used to manage your data collection, e.g. hospital staff collecting and/or collating data; photocopying; telephone; facsimile, etc.
- Informed consent is to be obtained from all participants in your study, if applicable;
- Policies, guidelines and protocols of the Department of Health and Grey's Hospital must be adhered to at all times;
- Professional attitude and behaviour whilst dealing with research participants must be exhibited;
- The Department of Health, hospital and its staff will not be held responsible for any negative incidents and/or consequences, including injuries and illnesses that may be contracted on site, litigation matters, etc. that may arise as a result of your study or your presence on site;
- You are required to submit to this office a summary of study findings upon completion of your research.
- You are requested to make contact with the HOD of Dietetics, **Mrs. Reshmee Lachman,** at Grey's Hospital, once you are ready to commence data collection.

Recommended by:

Dr L. Naidoo
Senior Manager: Medical Services

Supported by:

Dr. K. B. Bilenge
CEO

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

DIRECTORATE:

INKOSI ALBERT LUTHULI CENTRAL HOSPITAL
DIETETICS DEPARTMENT
Private Bag X03, Mayville, 4058
300 Vusi Mzimela (Bellair) Road, Mayville,4091
Tel: 031 240 1706 Fax: 0865215168 Email:

Date: 20/05/2021

To whom it may concern

Re: SUPPORT FOR MS VERTHARANI NOLENE NAICKER TO CONDUCT RESEARCH AT INKOSI ALBERT LUTHULI CENTRAL HOSPITAL

Ms. Naicker has approached the Dietetics Department at IALCH to participate in her study, in an effort to develop a staffing norm framework for dietitians in SA central and tertiary public hospitals.

Ms. Naicker has indicated that our involvement would entail filling in an online questionnaire at leisure. As such, we do not foresee it impacting on patient care at IALCH and the department's daily function.

As we are a department that encourages research and development we wish to support Ms. Naickers' efforts in improving nutrition services.

Regards,

Astrid Wichmann
Chief Dietician

Tobela Mabesa
Chief Dietician

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Dr. George Mukhari Academic Hospital

Office *of the Director Clinical Services*
Enquiries : Dr. C Holm
Tel : (012) 529 3691
Fax : (012) 560 0099
Email:Christene.Holm @gauteng.go.za
keitumetse.mongale@gauteng.gov.za

To Mrs V Naicker
Department of Health Sciences
University of Pretoria

Date :10 May 2021

PERMISSION TO CONDUCT RESEARCH:GP_202104_042

The Dr. George Mukhari Academic Hospital hereby grants you permission to conduct research on "Development of a staffing norm framework for dietitians at South African Central and Tertiary public hospitals" at Dr George Mukhari Academic Hospital.

This permission is granted subject to the following conditions:

- ☑ That you obtain Ethical Clearance from the Human Research Ethics Committee of the relevant University
- ☑ That the Hospital incurs no cost in the course of your research
- ☑ That access to the staff and patients at the Dr George Mukhari Hospital will not interrupt the daily provision of services.
- ☑ That prior to conducting the research you will liaise with the supervisors of the relevant sections to introduce yourself (with this letter) and to make arrangements with them in a manner that is convenient to the sections.
- ☑ Formal written feedback on research outcomes must be given to the Director: Clinical Services
- ☑ Permission for publication of research must be obtained from the Chief Executive Officer

Yours sincerely

DR. C. HOLM
DIRECTOR CLINICAL SERVICES
DATE: 10/5/21

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

STEVE BIKO ACADEMIC HOSPITAL

Enquiries: Dr JS Mangwane
Tel No: +2712 3452018
Fax No: +2712 354 2151
E-mail: joseph.mangwane@gauteng.gov.za

For attention: Vertharani Naicker

NHRD Ref Number: GP_202104_042

Re: REQUEST FOR PERMISION TO CONDUCT RESEARCH AT STEVE BIKO ACADEMIC HOSPITAL

TITLE: Development of a staffing norm framework for dietitians at South African Central and Tertiary public hospitals.

Permission is hereby granted for the above-mentioned research to be conducted at Steve Biko Academic Hospital.
This is done in accordance to the "Promotion of access to information act No 2 of 2000".
Please note that in addition to receiving approval from Hospital Research Committee, the researcher is expected to seek permission from all relevant department.
Furthermore, collection of data and consent for participation remain the responsibility of the researcher.
The hospital will not incur extra cost as a result of the research being conducted within the hospital.
You are also required to submit your final report or summary of your findings and recommendations to the office of the CEO.

Approved

Comment: _____

_____

_____

Date: 2021-05-12

_____

Dr. J S. Mangwane
Manager: Medical Service

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

TEMBISA PROVINCIAL TERTIARY HOSPITAL
PR NO: 5602793
Cnr Flint Mazibuko Dr & Rev Nemaire, Olifantsfontein, 1665
Private Bag X 07, Olifantsfontein, 1665
Tel: 011 923 2320
Enquiries: Dr A. Mthunzi
E-mail: Vusi.Mthunzi@gauteng.gov.za

To : **Ms Vertharani Nolene Naicker**

Subject : Permission to Conduct Research at Tembisa Provincial Tertiary Hospital Research Committee

From : Dr A Mthunzi, Chief Executive Officer, Tembisa Provincial Tertiary Hospital

Date : 22 September 2021

Ms Vertharani Nolene Naicker

This is to notify you that you have been granted permission to conduct research in our institution for the following study:

Study Title: ***"Development of a staffing norm framework for dietitians at South African central and tertiary public hospitals"***

NHRD Reference Number: GP_202104_042

Permission with the following restrictions:

- The study should not interfere with service provision.

Permission to conduct research as per study protocol

Please note the institution requires for all data collection and interaction with staff; patients or records to be as outlined in the study protocol and within the constraints of ethics approval obtained for this study. Should any of these parameters or professional conduct be violated at any stage then the Tembisa Research Committee reserves the right to review and change the decision to allow the researcher to conduct research at the institution.

Please report to the undersigned chair of the Research Committee with all your documents on the first day at the institution for further instructions and introductions.

Recommended by:
Dr M. Sethuntsa
Acting Clinical Support and Therapeutic Services Manager
Signature: _____
Date: 22-09-2021

Approved by:
Dr A. Mthunzi
CEO, Tembisa Provincial Tertiary Hospital
Signature: _____
Date: 21/09/2021

GAUTENG PROVINCE

REPUBLIC OF SOUTH AFRICA

MEDICAL ADVISORY COMMITTEE

CHRIS HANI BARAGWANATH ACADEMIC HOSPITAL

PERMISSION TO CONDUCT RESEARCH

Date: 8 June 2021

TITLE OF PROJECT:

Development of A Staffing Norm Framework For Dietitians At South African Central And Tertiary Public Hospitals

UNIVERSITY: Pretoria

Principal Investigator: Vertharani Nolene Naicker

Department: Human Nutrition

Supervisor/s : Dr Heather Legodi

Permission Head Department (where research conducted): Yes

NHRD No. GP_202104_042

The Medical Advisory Committee recommends that the said research be conducted at Chris Hani Baragwanath Academic Hospital. The CEO / management of Chris Hani Baragwanath Academic Hospital is accordingly informed and the study is subject to:-

- Permission having been granted by the Committee for Research on Human Subjects of the University of Pretoria.
- The Hospital will not incur extra costs as a result of the research being conducted on its patients within the hospital
- The MAC will be informed of any serious adverse events as soon as they occur
- Permission is granted for the duration of the Ethics Committee Approval.

Recommended
(On behalf of the MAC)
2021/06/08

Approved/~~Not Approved~~
Hospital Management Date:
Date: 09/06/202

health
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

MPUMALANGA
THE PLACE OF THE RISING SUN

No 3, Government Boulevard, Riverside Park, Ext. 2, Mbombela, 1200, Mpumalanga Province
Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel i: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Letter of Support (To be signed by relevant Senior Managers/Responsibility Managers)

1. Study Details	
1.1 Name of Applicant	Vertharani Naicker
1.2 Contact Number:	(0) 609619415
1.3 Study Title: Development of a staffing norm framework for dietitians at South African central and tertiary public hospitals	
1.4 Data collection period to undertake the study:	Start: 06/2021 End: 06/2022

1.5 Provide summary of the study, study area, and how data will be collected (your response should not be more than the space provided:

Background: The global human resources for health strategy indicates the necessity to prioritise human resources to improve health care and overall health outcomes. South Africa`s (SA) quadruple burden of diseases emphasises the need to prioritise nutrition services. However, there is no document informing the staffing requirements for dietitians in the hospital setting.
Aim: To develop a staffing norm framework for dietitians in SA central and tertiary public hospitals.
Methods: A three phase developmental study based on the Workload indicators for staffing (WISN) will be done. In Phase 1 (preparatory phase) the total number of dietitians across SA public hospitals and their distribution will be determined. In addition, the job descriptions of dietitians at central and tertiary public hospitals will be assessed. An online survey will be used to collect data. In phase 2 (consensus phase) current dietetic practices in the form of workload components and activity standards at all 22 central and tertiary public hospitals will be determined using the job descriptions. An online consensus process guided by the Delphi technique will be used. In phase 3 (finalisation phase) the actual workloads of the dietetic cadre and the number of dietitians required to provide the desired service at central and tertiary public hospitals will be determined based on the WISN ratio. This will be further supported by a case analyses of the findings based on the WISN methodology.
Benefits of the study: The framework will empower managers at central and tertiary hospitals in reviewing current staff and the future planning and forecasting of dietitians.
Expected outputs: Findings of the study will be submitted in the form of a PHD thesis with respective publications in peer referred journals and shared with the Department of Health.

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district i.e. the CEO/District Manager acknowledges to have been consulted on the study

5 Declaration

Declaration by Applicant:

I Mr/Ms/Dr/Prof/Adv. VERTHARANI NAICKER agree to submit/present the result of this study back to the CEO/Institution/District.

Estimated date of feedback: 28-Feb-23

To be signed by a relevant CEO/District Manager/Programme Manager/Senior Manager in Mpumalanga Province

Supported / ~~Not Supported~~ Supported

Signature: _____ **Date:** 2021/05/20

Name: _____

Rob Ferreira Provincial Hospital
Private Bag X11223 Nelspruit 1200
Tel: 013 741 6300
20 MAY 2021
Mrs FBG Nyabi
Chief Executive Officer
Email: FidelisNy@mpuhealth.gov.za

A duly signed form can be uploaded on the nhrd website by the researcher or emailed to: JerryS@mpuhealth.gov.za or ThembaM@mpuhealth.gov.za

Please note that this letter is not an approval to undertake a study, but a support letter from identified facility/district i.e. the CEO/District Manager acknowledges to have been consulted on the study

health
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

Indwe Building, Government Boulevard, Riverside Park, Ext. 2, Mbombela, 1200, Mpumalanga Province
Private Bag X11285, Mbombela, 1200, Mpumalanga Province
Tel I: +27 (13) 766 3429, Fax: +27 (13) 766 3458

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Enq: 013 766 3766
Ref: MP_202104_008

Research Permission Letter

Mrs Vertharani Naicker
A10 UNIT 5 ROSA ROYALE ESTATE
Olea Place
Johannesburg, 1865

STUDY TITLE: DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS

Dear Mrs Naicker

The Provincial Department of Health Research Committee has approved your research proposal in the latest format you sent, and hereby grant you permission to conduct your research as detailed below.

- Approval Reference Number: MP_202104_008
- Data Collection Period: 01/06/2021 to 01/11/2021
- Approved Data Collection Facilities:

* ROB FERREIRA HOSPITAL

Kindly ensure that conditions mentioned below are adhered to, and that the study is conducted with minimal disruption and impact on our staff, and also ensure that you provide us with a soft or hard copy of the report once your research project has been completed.

Conditions:
- *Researchers not allowed to make copies or take pictures of medical records.*
- *Kindly notify the facility manager a week BEFORE you start with data collection to ensure that conditions are conducive in the facility*

Kind regards

DR C NELSON
MPUMALANGA PHRC CHAIRPERSON
DATE: 29/06/2021

MPUMALANGA PROVINCE
DEPARTMENT OF HEALTH
29 -06- 2021
PRIVATE BAG X11285
NELSPRUIT 1200

MPUMALANGA
THE PLACE OF THE RISING SUN

MPUMALANGA PROVINCIAL GOVERNMENT

health
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

WITBANK HOSPITAL

Witbank Hospital,Mandela Avenue,Emalahleni,Mpumalanga
Private BagX11285,Mbombela,1200,Mpumalanga Province
Tel:013 653 2000, Fax:013 656 1314

Litiko Letemphilo | Departement van Gesondheid | UmNyango WezeMaphilo

Enquiries: Ms B.P Phiri
Tel: 072 321 2098

TO: Nolene Naicker
Nutrition Directorate
National Department of Health

FROM: Mrs K.A.P Madonsela
Chief Executive Officer
Witbank Hospital

DATE: 16/08/2021

RE- REQUEST FOR PERMMISSION TO CONDUCT RESEARCH AT WITBANK HOSPITAL.

We are pleased to inform you that we approve your request to conduct your academic research in the institution on The Development of a staffing Norm frame work for dieticians at Central and Tertiary public Hospitals in South Africa.

This is a factor that needs to be unveiled for the benefit dieticians in South Africa. We will Support you throughout the execution.

Regards

KP Madonsela

Mrs K.A.P Madonsela
CEO Witbank Hospital

18/08/2021
Date

LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

Department of Health

Ref : LP_2021-04-016
Enquires : Ms PF Mahlokwane
Tel : 015-293 6028
Email : Phoebe.Mahlokwane@dhsd.limpopo.gov.za

Vertharani Naicker

PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES

Your Study Topic as indicated below;

Development of a staffing norm framework for dietitians at South African central and tertiary public hospitals

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
    a. Present this letter of permission to the institution supervisor/s a week before the study is conducted.
    b. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
    c. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
    d. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
    e. The approval is only valid for a 1-year period.
    f. If the proposal has been amended, a new approval should be sought from the Department of Health
    g. Kindly note that, the Department can withdraw the approval at any time.

    Your cooperation will be highly appreciated

pp **Head of Department** **Date** 18/05/2021

health
Department of Health
FREE STATE PROVINCE

30 April 2021

Mrs V Naicker
Depart. Of Human Nutrition
UP

Dear Mrs. V Naicker

Subject: Development of a staffing norm framework for dietitians at South African Central and Tertiary Public Hospitals

- Please ensure that you read the whole document, Permission is hereby granted for the above – mentioned research on the following conditions:
- Participation in the study must be voluntary
- A written consent by each participant must be obtained.
- Serious Adverse events to be reported to the Free State department of health and/ or termination of the study
- Ascertain that your data collection exercise neither interferes with the day to day running of **Pelonomi & Universitas Hospital** nor the performance of duties by the respondents or health care workers.
- Confidentiality of information will be ensured and please do not obtain information regarding the identity of the participants.
- **Research results and a complete report should be made available to the Free State Department of Health on completion of the study (a hard copy plus a soft copy).**
- Progress report must be presented not later than one year after approval of the project to the Ethics Committee of the University of Pretoria and to Free State Department of Health.
- Any amendments, extension or other modifications to the protocol or investigators must be submitted to the Ethics Committee of the University of Pretoria and to Free State Department of Health.
- **Conditions stated in your Ethical Approval letter should be adhered to and a final copy of the Ethics Clearance Certificate should be submitted to** sebeelats@fshealth.gov.za **before you commence with the study**
- No financial liability will be placed on the Free State Department of Health
- **Please discuss your study with Institution Manager on commencement for logistical arrangements see 2nd page for contact details.**
- Department of Health to be fully indemnified from any harm that participants and staff experiences in the study
- **As part of feedback you will be required to present your study findings/results at the Free State Provincial health research day**

Trust you find the above in order.

Kind Regards

Dr D Motau
HEAD: HEALTH
Date: 5/5/2021

Western Cape Government
Health

DR T KERBELKER
Acting Manager: Medical Services
Red Cross War Memorial Children's Hospital
Email: Tamara.Kerbelker@westerncape.gov.za
Tel: +27 21 658 5383 Fax: +27 21 658 5006/5166

26 August 2021

Ms VN Naicker

Dear Ms Naicker,

RESEARCH: RXH: RCC 289 / WC_202104_031

PROJECT TITLE: Development of a Staffing Norm Framework for Dietitians at South African Central and Tertiary Public Hospitals

It is a pleasure to inform you that the hospital Research Review Committee has approved your application to conduct above-mentioned study at Red Cross War Memorial Children's Hospital.

Kindly note that this approval is subject to strict adherence to the HREC recommendations regarding research involving participants during COVID-19, dated 17 March 2020 (UCT HREC notice attached).

Yours sincerely,

DR T KERBELKER
ACTING MANAGER: MEDICAL SERVICES

Western Cape Government
Health

TYGERBERG HOSPITAL
REFERENCE:
Research Projects
ENQUIRIES: **Dr GG Marinus**
TELEPHONE:**021 938 5752**

Ethics Reference: 28561903

TITLE: **Development of a staffing norm of Human Nutrition (PhD): student number 28561903**

Dear VN Naicker

PERMISSION TO CONDUCT YOUR RESEARCH AT TYGERBERG HOSPITAL.

1. In accordance with the Tygerberg Hospital Health Research Policy and Protocol of **April 2018,** permission is hereby granted for you to conduct the above-mentioned research here at Tygerberg Hospital for a year based on your HREC approval.

2. Researchers, in accessing Provincial health facilities, are expressing consent to provide the Department with an electronic copy of the final feedback within six months of completion of research. This can be submitted to the Provincial Research Co-Ordinator (Health.Research@westerncape.gov.za).

DR GG MARINUS
MANAGER: MEDICAL SERVICES

Date: 20/7/2021

Administration Building, Francie van Zijl Avenue, Parow, 7500 Private Bag X3, Tygerberg, 7505
tel: +27 21 938-6267 fax: +27 21 938-4890 www.capegateway.gov.za

Western Cape Government
Health

GROOTE SCHUUR HOSPITAL
Enquiries: Dr Bernadette Eick
e-mail: GSHReserach.Request@westerncape.gov.za

MS V NOLENE NAICKER
UNIVERSITY OF PRETORIA

E-mail: nolene.naicker@health.gov.za

Dear Ms. Naicker

RESEARCH PROJECT: Development of a Staffing Norm Framework for Dieticians at South African Central and Tertiary Public Hospitals

Your recent letter to the hospital refers.

You are granted permission to proceed with your research, which is valid until **06 April 2022.**

Please note the following:

a) Your research may not interfere with normal patient care.
b) Hospital staff may not be asked to assist with the research.
c) Confidentiality must always be maintained.
d) No additional costs to the hospital should be incurred as indicated in your Annexure 2 i.e. Lab, consumables or stationery. **If access to TRACK Care/NHLS is required, kindly attach our letter of approval to the application form and approach Information Management to assist with data.**
e) **No patient folders may be removed from the premises or be inaccessible.**
f) Please provide the research assistant/field worker with a copy of this letter as verification of approval.
g) Should you at any time require photographs of your subjects, please obtain the necessary indemnity forms from our Public Relations Office (E45 OMB or ext. 2187/2188).
h) Should you require additional research time beyond the stipulated expiry date, please apply for an extension.
i) Please discuss the study with the HOD before commencing.
j) Please introduce yourself to the person in charge of an area before commencing.
k) On completion of your research, please forward any recommendations/findings that can be beneficial to use to take further action that may inform redevelopment of future policy / review guidelines.
l) Please contact Michelle Riley (Patient Fees) at ext. 2276 to ascertain if there will be charges for conducting the Research and to obtain a quote or to discuss charges
m) Kindly submit a copy of the publication or report to this office on completion of the research.
n) At no time should any posters encouraging patients to partake in research, be displayed within a clinical area.
o) Please adhere to ALL COVID-19 regulations and Groote Schuur Hospital policies.

I would like to wish you every success with the project.

Yours sincerely

DR BERNADETTE EICK
CHIEF OPERATIONAL OFFICER
Date: 03 August 2021

C.C. Mr. L. Naidoo, Mrs. A. du Toit, Mr. A. Mohamed

G46 Management Suite, Old Main Building,
Observatory 7925
Tel: +27 21 404 6288 fax: +27 21 404 6125

Private Bag X,
Observatory, 7935
www.westerncape.gov.za/health

DEPARTMENT OF HEALTH
LEFAPHA LA BOPHELO BO BOTLE
DEPARTEMENT VAN GESONDHEID
ISEBE LEZEMPILO

OFFICE OF THE HOD
Executive Offices
Northern Cape Department of Health
Private Bag X5049
KIMBERLEY, 8300
Tel: 053 830 2134
Email: BMashute@ncpg.gov.za

Enquiries: Dipatlisiso: Imibuzo: Navrae : Mr. B Mashute

Date: Leshupelo: Umhla: Datum: 11 May 2021

Reference: Tshupelo: Isalathiso: Verwysing: NC_202105_001

Mrs. Vertharani Nolene Naicker
University of Pretoria
Faculty of Health Sciences
School of Health Care Sciences
Department of Nutrition
Gezina, Pretoria
0031

Project Title: Development of a Staffing Norm Framework for Dietitians at South African central and tertiary public hospital.

Dear Mrs. Naicker

The application for gate-keeper's permission to conduct the above-mentioned research study in the Northern Cape was reviewed by the Northern Cape Department of Health.

Decision: Approval is hereby granted to conduct the above-mentioned study at Robert Mangaliso Sobukwe Hospital.

Your Provincial Ethics Reference Number is **NC_202105_001**, kindly use that reference number in correspondence with the Provincial Health Research Coordinator.

Please note the following:

1. This approval is valid for a period of one year from the date of approval.
2. The researcher must make all necessary arrangement with each the CEO of hospital, thus to ensure that the provision of healthcare services is not affected when the project is being conducted.

Please note the following conditions:

1. This research project must be conducted at no cost to the Northern Cape Department of Health.
2. The approval is limited to the research proposal as submitted on the application.
3. There must be no modification or amendments on the research project.
4. The Research Unit may monitor this research project at any time.
5. At the completion of this research project, a copy of the final report must be submitted to the Research Unit.
6. The Northern Cape Department of Health Senior Management must be briefed on the outcome of the study prior publishing.

Mr. Riaan Strydom
Acting Head of Department
Northern Cape Province
Department of Health

12/5/2021
Date

Province of the
EASTERN CAPE
HEALTH

Enquiries: Yvonne Gixela Tel no: 079 074 0859

Email: Yvonne.Gixela@echealth.gov.za / ygixela@gmail.com

Date: 23 April 2021

RE: *DEVELOPMENT OF A STAFFING NORM FRAMEWORK FOR DIETITIANS AT SOUTH AFRICAN CENTRAL AND TERTIARY PUBLIC HOSPITALS.* (EC_202104_009)

Dear Mrs V. Naicker

The department would like to inform you that your application for the abovementioned research topic has been approved based on the following conditions:

1. During your study, you will follow the submitted protocol with ethical approval and can only deviate from it after having a written approval from the Department of Health in writing.

2. You are advised to ensure, observe and respect the rights and culture of your research participants and maintain confidentiality of their identities and shall remove or not collect any information which can be used to link the participants.

3. The Department of Health expects you to provide a progress update on your study every 3 months (from date you received this letter) in writing.

4. At the end of your study, you will be expected to send a full written report with your findings and implementable recommendations to the Eastern Cape Health Research Committee secretariat. You may also be invited to the department to come and present your research findings with your implementable recommendations.

5. Your results on the Eastern Cape will not be presented anywhere unless you have shared them with the Department of Health as indicated above.

Your compliance in this regard will be highly appreciated.

SECRETARIAT: EASTERN CAPE HEALTH RESEARCH COMMITTEE

TOGETHER, MOVING THE HEALTH SYSTEM FORWARD

Province of the
EASTERN CAPE
HEALTH

Office of the Head of Clinical Support services • Level 2• Nelson Mandela Academic Hospital • Sisson Street• Fortgale• MTHATHA • Private Bag/Ingxowa • Eyodwa/Privaatsak X5152 • MTHATHA • 5100 • SOUTH AFRICA • Tell: 047 502 4512/4515 8•
Fax 047 502 4907/70 •Email: gift.tshaka@echealth.gov.za/gift.tshaka@gmail.com

To:	Dr A Mankahla: Acting CEO NMAH
From:	Manager Clinical Support: Mr. GS Tshaka
Subject:	Request for approval to collect data for the study on the development of staffing norms for dieticians – Nolene Naiker PHD student
Date:	24-03-2022

Purpose

To request your office to grant approval for Ms. Nolene Naiker to collect data at NMAH for her study on the development of staffing norms for dieticians.

Background

Ms. N Naiker is a PHD Dietetics student registered with the University of Pretoria, and is undertaking a study on the Development of Staffing norms for dietitians at central at tertiary hospitals of which NMAH is one of them. This study requires the participation of senior dieticians.

Motivation

There are currently no staffing norms in SA to determine staffing for dietitians, thus it is hoped that such a study can really benefit the department in the future planning and forecasting of dietitians.

She has received ethics approval through the University of Pretoria and research approval through the Eastern Cape provincial research department and are all attached for your easy reference.

Recommendation

Your office is recommended to grant permission for Ms. Nolene Naiker to collect data at NMAH for her study on the development of staffing norms for dieticians

Thank you

Mr. GS Tshaka

Head of Clinical Support

NMAH

Request to collect data from NMAH for research – Ms Nolene Naiker PHD dietetics student

Recommended/~~Not recommended~~

25/03/2022

Dr. M Nodikida

Acting Director Clinical Governance

Date

Comments:

Approved/~~not approved~~

25/03/2022

Dr. A. Mankahla

Acting CEO NMAH

Date

Comments:

Request to collect data from NMAH for research – Ms Nolene Naiker PHD dietetics student

health
Department of
Health
North West Province
REPUBLIC OF SOUTH AFRICA

Cnr Sekame & First Street
New Office Park
Matheng, 2745
Private Bag X2068
MMABATHO, 2735

Enq: Ms. Tshiamo Mokate
Tel: 018 391 4501
TMokate@nwpg.gov.za
www.nwhealth.gov.za

2030 NDP

RESEARCH, MONITORING AND EVALUATION DIRECTORATE

Name of researcher: **Mrs. V.N Naicker**
University of Pretoria

DEPARTMENT OF HEALTH
OFFICE OF THE SUPERINTENDENT GENERAL
18 -05- 2021
PRIVATE BAG X2068 MMABATHO 2735

Physical Address (Work/ Institution) _____

Subject **Research Approval Letter – Development of a staffing framework for dieticians at South African central and tertiary public hospitals.**

This letter serves to inform the Researcher that permission to undertake the above mentioned study has been granted by the North West Department of Health. The Researcher must arrange in advance a meeting with the District Chief Director and District Director to introduce their research team/members on the proposed research to be undertaken. Further to the above the researcher must produce this letter to the District and chosen facilities as proof that the research was approved by the NWDoH.

This letter of permission should be signed and a copy returned to the department. By signing, the Researcher agrees, binds him/herself and undertakes to furnish the Department with an electronic copy of the final research report. Alternatively, the Researcher can also provide the Department with electronic summary highlighting recommendations that will assist the Department in its planning to improve some of its services where possible. Through this the Researcher will not only contribute to the academic body of knowledge but also contributes towards the bettering of health care services and thus the overall health of citizens in the North West Province.

Below are the contact details of Office of the Chief Director and District Director for Bojanala and Dr. Kenneth Kaunda Districts.

Bojanala District

Office of the Chief Director	Office of the District Director
Mr. Pule Monale	Ms. Maggy Mere
PMonale@nwpg.gov.za	MMere@nwpg.gov.za/ebonye938@gmail.com
014 592 8906/ 159	014 592 8906/ 159

Dr. Kenneth Kaunda District

Office of the Chief Director	Office of the District Director
Mr. Ishmael Moloi	Ms. Keitumetse Mlambo
IMoloi@nwpg.gov.za	KMlambo@nwpg.gov.za
018 462 5744	018 462 5744

Kindest regards.

Dr. FRM Reichel
Director: RM&E

8/6/2021
Date

Appendix 11: Confirmation of submission of manuscript one to the Human Resources for Health Journal

Confirmation of your submission to Human Resources for Health - HRHE-D-23-00110 - [EMID:f031f351e26bad12]

H em.hrhe.0.82e879.ad0d931b@editorialmanager.com on behalf of Human Resources for Health Editorial Office <em@editorialmanager.com>
To: Nolene Naicker
Tue 2023-04-25 10:02

HRHE-D-23-00110
Application of the Workload Indicators of Staffing Need: A Case Study of the Dietetic Workforce at South African Central and Tertiary Public Hospitals
Vertharani Nolene Naicker; Keshan Naidoo; Jane W Muchiri; Heather M Legodi
Human Resources for Health

Dear Mrs Naicker,

Thank you for submitting your manuscript 'Application of the Workload Indicators of Staffing Need: A Case Study of the Dietetic Workforce at South African Central and Tertiary Public Hospitals' to Human Resources for Health.

The submission id is: HRHE-D-23-00110
Please refer to this number in any future correspondence.

During the review process, you can keep track of the status of your manuscript by accessing the following website:

https://www.editorialmanager.com/hrhe/

If you have forgotten your username or password please use the "Send Login Details" link to get your login information. For security reasons, your password will be reset.

Best wishes,
Editorial Office
Human Resources for Health
https://human-resources-health.biomedcentral.com/

Human Resources for Health

Vertharani Nolene Naicker | Logout

Home | Main Menu | Submit a Manuscript | About | Help

Page: 1 of 1 (1 total submissions)

Results per page 10

Action	Manuscript Number	Title	Initial Date Submitted	Date Revision Due	Status Date	Current Status	View Decision
View Submission File Inventory View Reference Checking Results Revise Submission Decline to Revise Send E-mail	HRHE-D-23-00110	Application of the Workload Indicators of Staffing Need: A Case Study of the Dietetic Workforce at South African Central and Tertiary Public Hospitals	25 Apr 2023	31 Aug 2023	21 Jun 2023	Revise	Revise before peer review

Appendix 12: Confirmation of submission of manuscript two to the Human Resources for Health Journal

Confirmation of your submission to Human Resources for Health - HRHE-D-23-00171 - [EMID:3e9b4577445646fc]

You forwarded this message on Tue 2023-06-13 13:17

H em.hrhe.0.83fcd9.e2182611@editorialmanager.com on behalf of Human Resources for Health Editorial Office <em@editorialmanager.com>
To: Nolene Naicker
Tue 2023-06-13 13:15

HRHE-D-23-00171
A staffing norm framework and implementation tool for dietitians: a South African Workload Indicators of Staffing Need (WISN) study
Vertharani Nolene Naicker; Keshan Naidoo; Jane W Muchiri; Heather M Legodi
Human Resources for Health

Dear Mrs Naicker,

Thank you for submitting your manuscript 'A staffing norm framework and implementation tool for dietitians: a South African Workload Indicators of Staffing Need (WISN) study' to Human Resources for Health.

The submission id is: HRHE-D-23-00171
Please refer to this number in any future correspondence.

During the review process, you can keep track of the status of your manuscript by accessing the following website:

https://www.editorialmanager.com/hrhe/

If you have forgotten your username or password please use the "Send Login Details" link to get your login information. For security reasons, your password will be reset.

Best wishes,
Editorial Office

← Submissions Being Processed for Author

Page: 1 of 1 (1 total submissions)

Results per page 10

Action	Manuscript Number	Title	Initial Date Submitted	Status Date	Current Status
View Submission View Reference Checking Results Send E-mail	HRHE-D-23-00171	A staffing norm framework and implementation tool for dietitians: a South African Workload Indicators of Staffing Need (WISN) study	13 Jun 2023	12 Aug 2023	Reviewers Assigned

Appendix 13: Presentation of Study Findings at Research Day

14h50	**Webinar 1** **Session Chair: Mr O Modiko & Dr D Van Jaarsveldt** **IT Support: Mr TR Tshilo & Mr J Engelbrecht**	**Webinar 2** **Session Chair: Me P Monyobo & Dr B Radebe-Msimanga** **IT Support: Mr P Maine & Ms N Matlosa**	**Webinar 3** **Session Chair: Dr C Barrett & Dr I Manduna** **IT Support: Mr M Lenyehelo & Mr G Matshai**	**Webinar 4** **Session Chair: Prof A Sherriff & Dr S Phakisi** **IT Support: Mr F Nkomo & Mrs K Motjakotja**	**Webinar 5** **Session Chair: Dr S Molefi & Mr EJ Watkins** **IT Support: Mr LD Kangausaru & Mrs M Phoka**	**Webinar 6** **Session Chair: Mr BJ Oliphant & Prof C Heunis** **IT Support: Mr M Mokhathi & Ms K Dinkebogile**
	Track 1: Improving Quality of Healthcare & Service Delivery - Three	**Track 2: Medical and Disease Management Impact to COVID-19 - Three**	**Track 8: Multi-, Inter- & Trans-Disciplinary approach to COVID-19**	**Track 9: Improving Human Resource for Health**	**Track 6: Burden of Disease - Two**	**Track 7: Health System Strengthening - Two**
14h00-14h10	*New South African innovation on medical male circumcision surgical aid* (MWP Kopung)	*Evaluating the mortality of drug-resistant TB patients during the COVID-19 pandemic in the Free State* (L Ntloko et al)	*Respiratory technologists in the frontlines against COVID-19* (HM Rosslee et al)	*Exploring clinical associates' work experiences and perceptions regarding their roles and responsibilities in line with their scope of practice in two districts in the Free State Province* (T Xhama et al)	*Epidemiology of kidney stones at Universitas Academic Hospital, South Africa* (J Sookram et al)	*Nephroblastoma at Universitas Academic Hospital Complex in the last 20 years* (E Brits et al)
14h10-14h20	*Optimisation of an HRM screening method and detection of TP53 gene variants in haematological malignancies in a central South African population* (J-M Grové et al)	*The determination of depression, anxiety, and stress among healthcare professionals at an Academic Hospital Complex during the COVID-19 pandemic* (A Smit et al)	*Towards bridging policy-practice gaps: Evidence of neglect of vulnerable groups by social workers during COVID-19 in Mangaung (MM Joubert et al)*	*Challenges in implementing the 72-our assessment of the Mental Healthcare Act 17 of 2002 in the Mangaung Metro Regional and District Hospitals of the Free State province, South Africa* (MA Mere)	*Danger in the bones – prevalence and underlying causes of thrombosis-related deaths* (W Janse van Rensburg et al)	*Reperfusion strategies for ST elevation myocardial infarction in patients referred to a Tertiary Hospital Department of Cardiology* (SP Willemse)
14h20-14h30	*The power of effective communication* (M Hattingh)	*Profiles of patients with myelomeningocele admitted to the neonatal unit at Universitas Academic Hospital in Bloemfontein* (N Pillay et al)	*Social listening and big data in healthcare: COVID-19 vaccine rollout* (H Combrink et al)	*A staffing norm framework to determine staffing needs for dietitians at SA central and tertiary public hospitals using the WISN methodology* (N Naicker et al)	*The use of geospatial mapping to identify locations of non-household tuberculosis transmission* (LM Mlambo et al)	*Tobacco smoking and cannabis use in men requesting circumcision in South Africa* (N Sabet)

Dear Mrs V Naicker

Thank you for presenting the topic: "***A staffing norm framework to determine staffing needs for dietitians at SA central and tertiary public hospitals using the WISN methodology***" at the 10th Annual Free State Provincial Health Research Day Conference.

The event could not have been a success without your participation and contributions. We are grateful for the time and effort you took to share your results and knowledge with us.

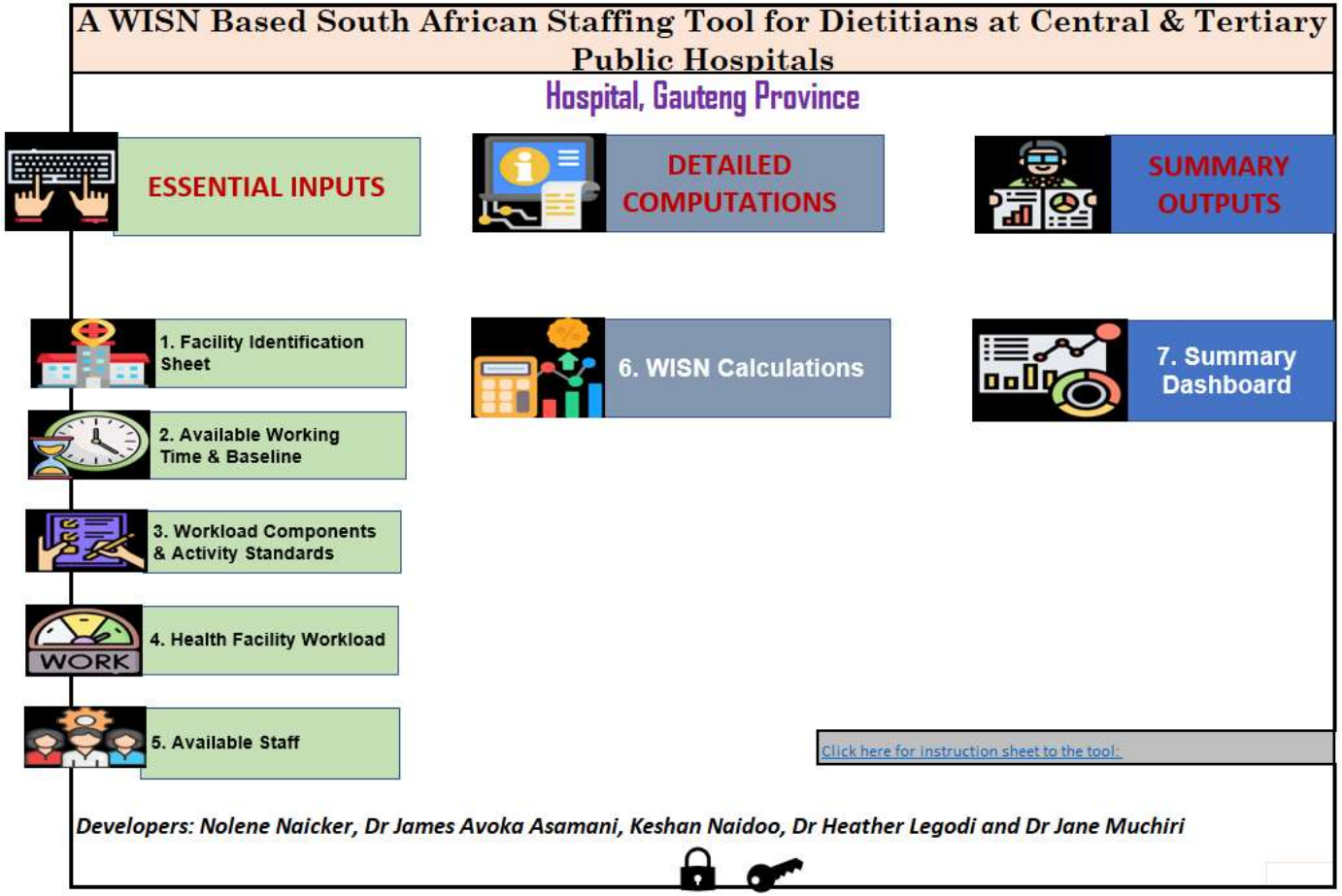
Much appreciation

The Research Organising Committee

health
Department of Health
FREE STATE PROVINCE

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
UFS UV

Appendix 14: WISN Based South African Excel Tool (actual tool submitted as a separate document)



Appendix 15: WISN Based South African Excel Tool User-Instruction Instruction Sheet

User Instruction Sheet: A South African WISN Based Staffing Tool for Dietitians at Central and Tertiary Public Hospitals

This staffing tool has been specifically contextualised to determine the staffing requirements of dietitians at central and tertiary public hospitals in South Africa. The service activities and activity standards that have been pre-populated into the tool have been researched for use through a Delphi consensus study for the cadre and level of care. Thus, this tool is not applicable for use by other cadres or for dietitians employed at other levels of care such as regional, district, specialised and primary health care facilities. The tool has also been validated against the WHO WISN software.

Follow this Step wise user instruction sheet to guide you in determining the staffing requirements of your facility.

User-Interface Sheet

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Hospital, Gauteng Province

ESSENTIAL INPUTS

DETAILED COMPUTATIONS

SUMMARY OUTPUTS

1. Facility Identification Sheet

2. Available Working Time & Baseline

3. Workload Components & Activity Standards

4. Health Facility Workload

5. Available Staff

6. WISN Calculations

7. Summary Dashboard

Click here for instruction sheet to the tool:

Developers: Nolene Naicker, Dr James Avoka Asamani, Keshan Naidoo, Dr Heather Legodi and Dr Jane Muchiri

The user-interface sheet allows for easy navigation between the excel spreadsheets. Follow the sequence of the icons depicted on the interface sheet by clicking on each icon as shown below:

ESSENTIAL INPUTS:

1. Facility Identification Sheet
2. Available Working Time & Baseline
3. Workload Components & Activity Standards
4. Health facility Workload
5. Available Staff

DETAILED COMPUTATIONS:

6. WISN Calculations

SUMMARY OUTPUTS:

7. Summary Dashboard

Step 1: Facility Identification Sheet

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Name of Province	
Name of Health Facility	Hospital
Health Facility Type	Tertiary Hospital

Complete this section to customise the tool for your facility.

- Select the name of your Province from the drop-down list:
  - ✓ Eastern Cape
  - ✓ Free State
  - ✓ Gauteng
  - ✓ KwaZulu Natal
  - ✓ Limpopo
  - ✓ Mpumalanga
  - ✓ Northern Cape

- ✓ Northwest
- ✓ Western Cape

- Type in the name of your health facility.
- Select your facility type e.g., Central or Tertiary hospital.

SELECT THE HOME ICON ON THE TOP RIGHT HAND CORNER TO NAVIGATE BACK TO THE INTERFACE SHEET

Step 2: Available Working Time & Baseline

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Description	Base Value	Minimum Value	Maximum Value	Explamatory Notes
Potential Days per Year	365			
Total Number of Non-Working Days (A)	**174**			
Weekends	104			
Public Holidays	12			
Annual Leave	26	22	30	Values highlighted in blue (column C) may be changed to suit your requirements if the existing values do not apply to your facility.
Certified Sick Leave	12			
Special Leave	10			
Training Days as per personal development plan	10			
Number of Working Hours per Day	8			
Available Working Days per Year	**191**			
Available Working Hours per Year	**1 528**			
Available Working Minutes per Year	**91 680**			

Complete this section to customise the Available Working Time (AWT) to suit the working times of dietitians at your facility. Only the following elements highlighted in blue may be changed as these are not fixed elements in the tool:

- Include annual leave days
- Include sick leave days
- Include special leave days
- Include training days per year

Please note that the tool will calculate the available working days, hours and minutes per year based on the above values.

SELECT THE HOME ICON ON THE TOP RIGHT HAND CORNER TO NAVIGATE BACK TO THE INTERFACE SHEET

Step 3: Workload Components and Activity Standards

It must be noted that the Workload Components and related activity standards have already been pre-populated as the primary service activities practiced by dietitians at central and tertiary public hospitals based on a consensus exercise.

Part A: Health Service Activities

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Code	Health service activities	Activity standards	Explanatory notes
HSA1	Ward rounds (individual and multidisciplinary)	10	
HSA2	Patient screening	5	
HSA3	In Patient consultation and treatment (New)	30	
HSA4	In patient nutritional assessment (ABCDE) & diagnosis (New)	15	
HSA5	In patient calculation of nutritional requirements & development of nutrition intervention plans (New)	15	
HSA6	In patient nutrition support and dietary counseling (New)	30	
HSA7	In patient consultation and treatment (FU)	15	These health service activities are fixed and may not be changed or removed.
HSA8	In patient referral, communication with the multidisciplinary team and related activities	10	
HSA9	Outpatient consultation and treatment (New)	45	
HSA10	Outpatient nutritional assessment (ABCDE) & diagnosis (New)	15	
HSA11	Outpatient nutritional plan and Intervention including dietary counseling (New)	30	
HSA12	Outpatient consultation and treatment (FU)	30	
HSA13	Outpatient /specialist clinics (cerebral palsy, diabetes etc)	45	
HSA14	Report writing and patient notes	15	
HSA15	Referral process including writing of letters (between health facilities)	10	
HSA16			Other health service actvities may be added in the green highlighted rows if applicable to your facility
HSA17			
HSA18			
HSA19			

- Please note that this section includes pre-populated health service activities and activity standards, and these are fixed in the tool.
- Additional health service activities may be added as required in the rows highlighted in blue following the pre-populated activities. Please note that only a maximum of five additional health service activities may be added to this list.
- Should there be a need for other health service activities to be included, then each health service activity must be accompanied by an activity standard in minutes per patient.

Part B: Support Service Activities

Code	Support activities	Hours per year	Explanatory notes
SA1	Food service management (developing and updating of cycle menus, therapeutic diets & related diet sheets)	24	These support service activities are fixed and may not be changed or removed.
SA2	Development and review of policies, protocols and guidelines (including related IEC materials)	36	
SA3	Dietetics departmental meetings	38	
SA4	Hospital committee/ internal stakeholder meetings	44	
SA5	Meetings with industry representatives and other external stakeholders	18	
SA6	Own performance development and management system (PMDS) reporting	8	
SA7	CPD activities	24	
SA8	Participation in journal reviews and working groups	38	
SA9	In-service training to the multidisciplinary team (nurses, doctors etc)	12	
SA10	In-service training to the food service team	8	
SA11	Students mentoring (training), evaluation & reporting (including meeting with universities and accrediation of facilities)	90	
SA12	Attend training (generic)	18	
SA13	Recordkeeping, statistics & report writing	48	
SA14	Peer reviews and clinical audits	24	
SA15	Outpatient health awareness events/campaigns/open days (planning and participation)	20	
	Total hours per annum	**450,00**	

- This sheet also includes a pre-populated list of support service activities with aligned activity standards. There is no need to populate any data on this section of the spreadsheet.

Part C: Additional Service Activities

Code	Individual/additional Activities	Hours per year	Number dietitians performing the additional activities	Explanatory notes
AA1	Managerial duties (risk management, financial management (budgeting and procurement), asset management, planning of duty rosters)	24	1	These additional service activities are fixed and may not be changed or removed. You may only add the number of dietitians that are responsible for each of these activities in column E
AA2	Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	24	1	
AA3	Develop and review departmental plans (strategic, business and operational)	16	1	
AA4	Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	24	1	
AA5	Report writing, validations and presentations	36	6	
AA6	Human resource management (recruitment, selection of new staff, grieviances and disciplinary processes, HPCSA registration & compliance, attendance and leave register)	48	1	
AA7	Orientation of new staff, training, support and supervision of lower level staff and community service dietitians	191	1	
AA8	Performance development and management system (PMDS)	20	1	
AA9	Participation in research activities	24	6	
AA10	National core standards (QIP)-develop plans, evaluation and reports	19	1	
AA11	Planning and coordination of departmental meetings	36	1	
AA12	District, provincial INP and allied Meetings	24	2	
AA13	MBFI mentor/committee participation and activities	24	1	
AA14	Education, training and supervision of foodservice/diet kitchen staff/milk kitchen/tube feed personnel	53	6	
	Total hours per annum	**563**		

- This section includes a pre-populated list of additional service activities with aligned activity standards.
- It must be noted that additional service activities are usually only performed by certain dietitians and not by all dietitians at the facility.
- Thus, include the number of dietitians responsible for performing each additional service activity in the row highlighted in blue (Column E).

SELECT THE HOME ICON ON THE TOP RIGHT HAND CORNER TO NAVIGATE BACK TO THE INTERFACE SHEET

Step 4: Health Facility Workload

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Code	Health service activities	Health service statistics	Explanatory notes
HSA1	Ward rounds (individual and multidisciplinary)	37056	
HSA2	Patient screening	37056	
HSA3	In Patient consultation and treatment (New)	11642	
HSA4	In patient nutritional assessment (ABCDE) & diagnosis (New)	37056	
HSA5	In patient calculation of nutritional requirements & development of nutrition intervention plans (New)	2509	
HSA6	In patient nutrition support and dietary counseling (New)	833	
HSA7	In patient consultation and treatment (FU)	25414	
HSA8	In patient referral, communication with the multidisciplinary team and related activities	192	Health service statistics are required for each health service activity based on annual patient statistics.
HSA9	Outpatient consultation and treatment (New)	1124	
HSA10	Outpatient nutritional assessment (ABCDE) & diagnosis (New)	2301	
HSA11	Outpatient nutritional plan and Intervention including dietary counseling (New)	2301	
HSA12	Outpatient consultation and treatment (FU)	1178	
HSA13	Outpatient /specialist clinics (cerebral palsy, diabetes etc)	531	
HSA14	Report writing and patient notes	39357	
HSA15	Referral process including writing of letters (between health facilities)	70	
HSA16	-		
HSA17	-		
HSA18	-		
HSA19	-		
HSA20	-		

- Include health service statistics for each health service activity listed in the spreadsheet and for any newly added health service activities. Health service statistics must be reflected as the number of patients consulted for the health service activity per annum E.g., Ward rounds (individual and multidisciplinary)- 1000

SELECT THE HOME ICON ON THE TOP RIGHT HAND CORNER TO NAVIGATE BACK TO THE INTERFACE SHEET

Step 5: Available Staff

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Description	Base Value	Minimum Value	Maximum Value	Explamatory Notes
Potential Days per Year	365			
Total Number of Non-Working Days (A)	**174**			
Weekends	104			
Public Holidays	12			
Annual Leave	26	22	30	Values highlighted in blue (column C) may be changed to suit your requirements if the existing values do not apply to your facility.
Certified Sick Leave	12			
Special Leave	10			
Training Days as per personal development plan	10			
Number of Working Hours per Day	8			
Available Working Days per Year	**191**			
Available Working Hours per Year	**1 528**			
Available Working Minutes per Year	**91 680**			

- Populate the numbers of dietitians currently employed by your health facility per rank together with their aligned annual salary in column C and D highlighted in blue to provide the overall estimated cost.

SELECT THE HOME ICON ON THE TOP RIGHT HAND CORNER TO NAVIGATE BACK TO THE INTERFACE SHEET

Step 6: WISN Calculations

- This spreadsheet provides an indication of the WISN calculations that have been coded into the tool as per the WHO WISN manual.

1. Standard Workloads have been calculated for each health service activity and is based on: **STANDARD WORKLOAD = (AWT/UNIT TIME)** depicted as **A**

Health service activities	Activity standard	Standard workload	Staff required for activity (in FTE) - [A]
Ward rounds (individual and multidisciplinary)	10	9 168	4,04
Patient screening	5	18 336	2,02
In Patient consultation and treatment (New)	30	3 056	3,81
In patient nutritional assessment (ABCDE) & diagnosis (New)	15	6 112	6,06
In patient calculation of nutritional requirements & development of nutrition intervention plans	15	6 112	0,41
In patient nutrition support and dietary counseling (New)	30	3 056	0,27
In patient consultation and treatment (FU)	15	6 112	4,16
In patient referral, communication with the multidisciplinary team and related activities	10	9 168	0,02
Outpatient consultation and treatment (New)	45	2 037	0,55
Outpatient nutritional assessment (ABCDE) & diagnosis (New)	15	6 112	0,38
Outpatient nutritional plan and Intervention including dietary counseling (New)	30	3 056	0,75
Outpatient consultation and treatment (FU)	30	3 056	0,39
Outpatient /specialist clinics (cerebral palsy, diabetes etc)	45	2 037	0,26
Report writing and patient notes	15	6 112	6,44
Referral process including writing of letters (between health facilities)	10	9 168	0,01
0	0	0	0,00
0	0	0	0,00
0	0	0	0,00
0	0	0	0,00
0,00	0	0	0,00
Total minutes per patient		**92 699**	**29,57**
Total hours per patient			

A

2. Category Allowance factors have been calculated for each support service activity and is based on **CAF =*1/ [1-(TOTAL CAS /100)]*** depicted as **B**

Support activities	Support activity standards	Category allowance standard	Category allowance factor - [B]
Food service management (developing and updating of cycle menus, therapeutic diets & related diet sheets)	24	1,6%	1,016
Development and review of policies, protocols and guidelines (including related IEC materials)	36	2,4%	1,024
Dietetics departmental meetings	38	2,5%	1,026
Hospital committee/ internal stakeholder meetings	44	2,9%	1,030
Meetings with industry representatives and other external stakeholders	18	1,2%	1,012
Own performance development and management system (PMDS) reporting	8	0,5%	1,005
CPD activities	24	1,6%	1,016
Participation in journal reviews and working groups	38	2,5%	1,026
In-service training to the multidisciplinary team (nurses, doctors etc)	12	0,8%	1,008
In-service training to the food service team	8	0,5%	1,005
Students mentoring (training), evaluation & reporting (including meeting with universities and accrediation of facilities)	90	5,9%	1,063
Attend training (generic)	18	1,2%	1,012
Recordkeeping, statistics & report writing	48	3,1%	1,032
Peer reviews and clinical audits	24	1,6%	1,016
Outpatient health awareness events/campaigns/open days (planning and participation)	20	1,3%	1,013
Total hours per annum	450	29,5%	1,417

B

3. Individual Allowance factors have been calculated for each additional service activity and is based on ***IAF =TOTAL IAS /AWT*** depicted as **C**

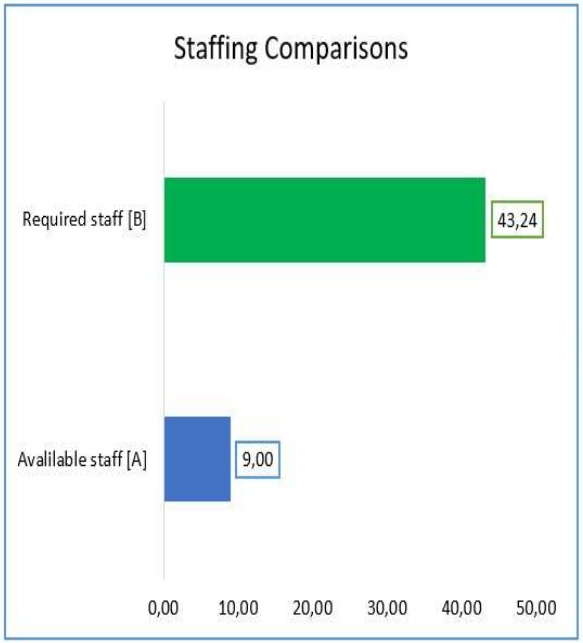
Individual/additional Activities	Number of dietitians performing the additional activities	Individual allowance standard	Individual allowance factor - [C]	
Managerial duties (risk management, financial management (budgeting and procurement), asset management, planning of duty rosters)	1	24	0,016	
Audits (stock take and stock take audits, diet sheet audits, equipment audits etc)	4	96	0,063	
Develop and review departmental plans (strategic, business and operational)	1	16	0,010	
Evaluate and monitor the implementation of policies/strategies/guidelines/protocols and norms and standards	2	48	0,031	
Report writing, validations and presentations	1	36	0,024	
Human resource management (recruitment, selection of new staff, grievances and disciplinary processes, HPCSA registration & compliance, attendance and leave register)	1	48	0,031	
Orientation of new staff, training, support and supervision of lower level staff and community service dietitians	6	1146	0,750	
Performance development and management system (PMDS)	1	20	0,013	
Participation in research activities	1	24	0,016	
National core standards (QIP)-develop plans, evaluation and reports	1	19	0,012	
Planning and coordination of departmental meetings	1	36	0,024	
District, provincial INP and allied Meetings	2	48	0,031	
MBFI mentor/committee participation and activities	6	144	0,094	
Education, training and supervision of foodservice/diet kitchen staff/milk kitchen/tube feed personnel	6	318	0,208	
Total hours per annum		**2023**	**1,324**	**C**

SELECT THE HOME ICON ON THE TOP RIGHT HAND CORNER TO NAVIGATE BACK TO THE INTERFACE SHEET

Step 7: Summary Dashboard

A South African WISN Based Staffing Tool for Dietitians at Central & Tertiary Public Hospitals

Description	Results	Explanation
Avalilable staff [A]	9,00	The health facility has 9 dietitians
Required staff [B]	43,24	Based on WISN calculations the health facility requires the Full-Time Equivalence (FTE) of 43,24 dietitians
WISN difference	-34,24	
WISN ratio	0,21	Shortage of Dietitians
Workload pressure	79%	High Workload



- This spreadsheet populates the number of available dietitians as added in the Available Staff Sheet. The number of required dietitians is also calculated based on the data populated in the preceding datasheets. Thus, giving you an idea of the WISN calculated requirement of dietitians for your facility.
- An interpretation of the ***WISN Difference*** (Available Staff -Required Staff) provides an indication of the level of under OR over staffing at your facility.
- An interpretation of the ***WISN Ratio*** (Available Staff/Required Staff) will provide an indication of the level of work pressures experienced by dietitians at your facility. This ratio can be interpreted as follows:
    - ***A Ratio of Equal to 1*** – Means the existing number of dietitians are adequate to meet the dietetic staffing demands of your facility
    - ***A Ratio of More than 1***-Means the existing number of dietitians are more than adequate to meet the dietetic staffing demands of the facility (indicating overstaffing of dietitians at your facility)
    - ***A Ratio of Less than 1***-Means the existing number of dietitians are inadequate to meet the dietetic staffing demands of the facility (indicating understaffing of dietitians at your facility and increased workload pressures)

Note: It is recommended that these staffing requirements are reviewed periodically based on annual statistics and as aligned to operational and strategic plans of the facility to allow for appropriate forecasting and budgeting of the dietetic cadre