

**An educational intervention to improve the  
quality of care of diabetic patients**

by

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**Submitted in fulfilment of the requirements for the degree:**

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**in the Faculty of Health Sciences**

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Last but not least, I sincerely thank my children, parents and close friends who supported me throughout the time I was working on this project.

## of Diabetic Patients

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**A. Declaration**



Project Supervisor: **Prof Paul Rheeder**

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I declare that the dissertation/thesis, which I hereby submit for the degree MSc(Clinical Epidemiology) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at another university.

Signature:

Date:

This study was approved by the Ethics Committee of the Pretoria Academic Hospital.

## B. Publication and Present



This work has been published in the following journal:

South African Medical Journal (S Afr Med J) 2002 ; **92 (6)** : 459-464

D : dissatisfied

An abstract was also presented at the :

Society for Endocrinology, Metabolism and Diabetes of South Africa  
(SEMDSA) congress in 2001 as an oral presentation

DPS : Diabetes Practice Scale

HbA<sub>1c</sub> : Haemoglobin A<sub>1c</sub> = Glycated Haemoglobin

HRQOL : Health Related Quality of Life

MBChB : Baccalaureus in Medicine and Surgery

MD : Doctorate in Medicine

mmol/l : millimol per litre

mm Hg : Millimeters mercury

MMed : Magister in Medicine

MS : Microsoft

MSc : Magister in Science

N : Number

Prof : Professor

RCT : Randomised Controlled Trial

S : Satisfied

SD : Standard Deviation

TP : Tibialis Posterior

VD : Very Dissatisfied

Vol : Volume

VS : Very satisfied

## C. List of Abbreviations



ANCOVA : Analysis of Covariance

COPD : Chronic Obstructive Pulmonary Disease

D : dissatisfied

DAS : Diabetes Attitude Scale

DM : Diabetes Mellitus

DP : Dorsalis Pedis

DPS : Diabetes Practice Scale

HbA<sub>1c</sub> : Haemoglobin A<sub>1c</sub> = Glycated Haemoglobin

HRQOL : Health Related Quality of Life

MBCChB : Baccalaureus in Medicine and Surgery

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**Table 1.** Results of the Diabetes Attitude Scale (DAS-3)

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**Table 4.** Baseline Characteristics of the Study Population

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**Keywords:** Diabetes ; Diabetes Education ; Diabetes Attitude Scale.

**Graad:** MSc (Kliniese Epidemiologie)

**Inleiding:**

Daar is 'n gebrek aan studies wat kyk na intervensies om die sorg van  
gehospitaliseerde diabetiese pasiënte te verbeter en die doel van hierdie  
studie was dus om te ondersoek of 'n opvoedkundige intervensie aan dokters  
die kwaliteit van sorg aan diabetiese pasiënte kan verbeter.

**Metode:**

Hierdie studie was 'n ongekontroleerde voor- en na-intervensiestudie in 'n  
tersiêre sorg hospitaal in Pretoria. Dokters werksaam in die departement  
Inferne Geneeskunde was die populasie waarop die twee opvoedings  
intervensie sessies, oor sorg aan diabetiese pasiënte wat gehospitaliseer  
was, uitgevoer is. 'n Gestandaardiseerde Diabetes houdingskaal (Diabetes  
Attitude Scale DAS-3) en Diabetes Praktijk kwelys is deur alle dokters  
voltooi voor die aanvang van die opvoeding sessie en ook na voltooiing van die  
laaste sessie. Inligting van gehospitaliseerde diabetiese pasiënte is versamel  
vir vyf weke voor die eerste inligting sessie en ook weer vir 'n tydperk van vyf



## 'n Opvoedkundige Intervensie om die Kwaliteit van sorg aan Diabetiese

**Pasiënte te Verbeter**

**deur**

**Helena Oosthuizen**

**Promotor: Prof Paul Rheeder**

**Departement: Kliniese Epidemiologie**

**Skool van Geneeskunde**

**Fakulteit van Gesondheidswetenskappe**

**Graad: MSc (Kliniese Epidemiologie)**

### **Inleiding:**

Daar is 'n gebrek aan studies wat kyk na intervensies om die sorg van gehospitaliseerde diabetiese pasiënte te verbeter en die doel van hierdie studie was dus om te ondersoek of 'n opvoedkundige intervensie aan dokters die kwaliteit van sorg aan diabetiese pasiënte kan verbeter.

### **Metode:**

Hierdie studie was 'n ongekontroleerde voor-en na-intervensiestudie in 'n tersiêre sorg hospitaal in Pretoria. Dokters werksaam in die departement Interne Geneeskunde was die populasie waarop die twee opleidings intervensie sessies, oor sorg aan diabetiese pasiënte wat gehospitaliseer was, uitgevoer is. 'n Gestandaardiseerde Diabetes houdingskaal (Diabetes Attitude Scale DAS-3) en Diabetiese Praktyk vraelys is deur alle dokters voltooi voor die aanvang van die opleiding sessie en ook na voltooiing van die laaste sessie. Inligting van gehospitaliseerde diabetiese pasiënte is versamel vir vyf weke voor die eerste inligting sessie en ook weer vir 'n tydperk van vyf

weke na die voltooiing van die lesings sessie. Hierdie twee stellings inligting is met mekaar vergelyk om die effek van die opleiding te evalueer.

### **Resultate:**

Subskale van die Diabetiese houdingskaal het verbetering getoon met 'n statisties betekenisvolle verbetering in die houding teenoor ernstigheid van diabetes mellitus ( $p = 0.03$ ) en 'n neiging na verbetering in houdings teenoor nodigheid vir spesiale opleiding en ook pasiënt outonomie. Meeste van die items in die Diabetiese Praktykskaal (DPS) het betekenisvol verbeter ( $p < 0.05$ ).

### **Gevolgtrekking:**

'n Kort opleidingsintervensie het gelei tot 'n verbetering in houding, kennis en kliniese hantering van diabetiese pasiënte.

### **Methods:**

This was an uncontrolled before-after interventional study in a tertiary care hospital in Pretoria. Doctors working in the Department of Internal Medicine were the subjects of two interventional sessions on diabetic care and all diabetic patients admitted to the wards in Internal Medicine were evaluated. Diabetes Attitude scale (DAS-3) and a Diabetic Practice Scale (DPS) were completed by each doctor before and after the interventional educational sessions. Data from diabetic patients in the wards were collected for 5 weeks before the interventional training and for 5 weeks after the interventional training and these 2 sets of data were compared to measure the effect of the interventional training.

## An Educational Intervention to Improve the Quality of Care of Diabetic

Patients  
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Helena Oosthuizen

Promotor: Prof Paul Rheeder

Department: Clinical Epidemiology

School of Medicine

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Degree: MSc (Clinical Epidemiology)

### Introduction:

As few studies have addressed intervention for in-hospital care of diabetes mellitus, the purpose of this study was to investigate if an educational intervention for doctors could improve the quality of care for diabetic patients.

### Methods:

This was an uncontrolled before-after interventional study in a tertiary care hospital in Pretoria. Doctors working in the Department of Internal Medicine were the subjects of two interventional sessions on diabetic care and all diabetic patients admitted to the wards in Internal Medicine were evaluated. Diabetes Attitude scale (DAS-3) and a Diabetes Practice Scale (DPS) were completed by each doctor before and after the interventional educational sessions. Data from diabetic patients in the wards were collected for 5 weeks before the interventional training and for 5 weeks after the interventional training and these 2 sets of data were compared to measure the effect of the interventional training.

## 1. Introduction :

### **Results:**

Sub-scales of the Diabetes Attitude scale (DAS-3) showed an improvement, with a statistically significant improvement in attitude regarding seriousness of diabetes mellitus ( $p=0.03$ ) and a trend towards improvement in attitudes regarding need for special training and patient autonomy. Most of the items on the Diabetes Practice Scale (DPS) improved significantly ( $p < 0.05$ ).

### **Conclusions:**

A short educational intervention resulted in an improvement in attitude, knowledge and clinical management of diabetic patients.

## 1. Introduction :

Type 2 diabetes mellitus is a chronic disease and it affects a patient's overall health and well-being in several ways. The appropriate treatment of a diabetic patient is based on the knowledge of the underlying pathophysiology of the disease. In South Africa, improving the quality of health care is an important focus for health systems development.<sup>1</sup> However, creation of a culture of quality requires commitment from health workers, patients and communities, with a major shift in existing thinking about health care.<sup>2</sup> Ultimately, quality stems from an attitude that fosters continuous service improvements,<sup>2</sup> by enthusiastic and motivated health care providers.<sup>3</sup> This service is based on patient and community needs and is delivered in conformity with established standards.<sup>2</sup>

Donabedian has provided a model for the assessment of quality of care, which consists of structure, process and outcome.<sup>4</sup> Structure refers to material and human resources and the organisational structure; process relates to health care provider and patient activities in giving and receiving care; and outcome denotes the effects of care on the health status of patients and communities.<sup>4</sup> Donabedian includes patient satisfaction as an outcome of care as well as an element of health status.<sup>4</sup>

There is general agreement that patient satisfaction is an integral component of service quality,<sup>5-6</sup> since expanded definitions of health service quality make explicit mention of patient satisfaction.<sup>7</sup> It has been proposed that the effectiveness of health care is determined by satisfaction with the services provided. Support for this viewpoint has been found in studies that have reported a satisfied patient is more likely to utilise health services,<sup>8</sup> comply

with medical treatment,<sup>9</sup> and continue with the health provider.<sup>10</sup> It is important to realize that the prevalence of depression and anxiety is approximately three times higher in patients with diabetes when compared with the general population and this can influence glycaemic control and satisfaction of the patient.<sup>22</sup> Intensive treatment would improve diabetic patients' outcomes in terms of morbidity and mortality, but the patients must be committed to long-term major changes in lifestyle for the effect to be beneficial. The problem is that the physician's concept of diabetes may be very different from the patient's and only if there is good communication between the patient and health care provider and the physician accepts patient autonomy can they implement a treatment plan that is acceptable to both with success in maintaining good glycaemic control.<sup>24</sup>

In 1975, the National Diabetes Commission's report to the United States Congress raised several issues concerning health providers attitudes towards diabetes mellitus.<sup>31</sup> This report suggested that attitudes were often inappropriate and could lead to apathy, anxiety, depression, insecurity, confusion and disorganisation in a diabetic patient's life. The Commission recommended the development of an attitude scale and proposed that attitudes should be assessed pre and post intervention activities.<sup>11</sup> In accordance with Donabedian's model,<sup>4</sup> attitudes affect the process component, which is linked to outcome. For example, inappropriate health care provider attitudes towards diabetic patients could lead to poor compliance with therapy and an increase in complications (poor outcome).

During the 1990s, there has been considerable interest in assessing the quality of health care for diabetic outpatients in South Africa.<sup>12-15</sup> Major

findings were: poor patient glycaemic and blood pressure control;<sup>12</sup> a high prevalence of diabetes complications;<sup>12</sup> inadequate examinations for treatable complications;<sup>13</sup> discrepancies between recommended care and practice;<sup>14</sup> staff/patient communication barriers<sup>14</sup> and a lack of comprehensive patient care.<sup>15</sup> These findings suggest that the quality of care for diabetic patients is poor. However, none of these studies used a model for assessing quality of care, or used a standardised attitude scale, or considered patient satisfaction as an outcome of care. It is important to understand that treatment satisfaction and health related quality of life are two distinct phenomena.<sup>26</sup>

Application of Donabedian's model<sup>4</sup> to these findings reveals that there are major problems in structure, process and outcome as well as the linkages between these components. For example, improved blood glucose and blood pressure control (outcome components) requires the activities of both health care providers and patients (process components). The focus on service activities demotes patients to passive recipients of health care. Overloaded clinics (organisational structure) are often blamed for inadequate examinations, discrepancies between recommended care and practice and the lack of patient education (process). Re-organisation may lead to better process and outcomes, but without service commitment and appropriate health provider attitudes, service activities will not improve.<sup>2</sup>

Most quality of care assessments were conducted in long-term ambulatory settings, without using a model to guide the research process, or attempting to assess patient satisfaction. Few studies have evaluated in-hospital care for diabetes mellitus or developed an intervention for improving the quality of health care. Yet, the hospital setting can provide an ideal opportunity for

optimising blood glucose and blood pressure control, screening for diabetes mellitus complications, patient education and health provider in-service training.

In a previous study it was found that improved glycaemic control is associated with favourable mood and possibly general well-being in type 2 diabetic patients.<sup>23</sup> By assessing quality of care from both health provider and patient perspectives, the present study will increase our understanding of the components of the quality of health care. In addition, the development and testing of the intervention will be invaluable for future policy and practice on improving the quality of health care for both diabetic outpatients and hospitalised patients.

In a small study where it was tried to alter the health care providers understanding of the diabetes consultation with a model of 4-5 sessions where they reviewed a videotaped consultation of the health care provider with a tutor, it was found that the health care professionals changed their ways of experiencing the encounter after the intervention.<sup>25</sup>

As few studies have addressed intervention for in-hospital care of diabetes mellitus, we set out to investigate if an educational intervention for doctors could improve the quality of care to diabetic patients. One of the practical restrictions was that there was only access to one Academic Tertiary Care Centre and that the models between different Tertiary Care Centres differ so much that another centre could not be used for comparison. Another problem was financial restrictions and therefore a before and after - intervention study was used.



## 2. Aims



### 2.1 Primary aim

The overall aim of the study was to investigate the effect of an educational intervention programme regarding diabetes on doctors' attitudes and practices

registrars, medical officers and specialists in the Department of Internal

### 2.2 Secondary aim

To evaluate the effect on patient satisfaction of an educational intervention to doctors.

Pretoria Academic Hospital was selected as the study site, due to the

high level of patient involvement in the Diabetic Outpatient

## 3. Objectives

### 3.1 Primary endpoints

The difference in the scores according to the Diabetes Attitude

Scale (Appendix A) and Diabetes Practice Scale (Appendix B) before and after the intervention.

The difference in work-up of patients before and after the educational intervention

#### 3.1.1 Diabetes Attitude Scale (DAS-3)

### 3.2 Secondary endpoints

in 5 subscales that measure: (1) the need

to know more about diabetes; (2) the value of

diabetes education; (3) the impact of diabetes; and (5) patient

satisfaction. The Cronbach's alpha for the scale was 0.85 (reliability), slightly lower than Nunnally's recommendation of 0.90. Health providers who were more involved with diabetic

patients had higher scores on the scale, indicating that they were more

This study was approved by the Ethics Committee of the Pretoria Academic

Hospital. The study was conducted in a clinic with diabetic patients, and the attitudes of nurses and

assistants were more positive than those of physicians, providing some

support for the validity of the scale.

## 4. Methodology:

### 4.1 Research Design

A repeat cross-sectional, observational study was conducted with hospitalised diabetic patients. An intervention-evaluation study was conducted on registrars, medical officers and specialists in the Department of Internal Medicine.

### 4.2 Study Site

Pretoria Academic Hospital was selected as the study site, due to the Principal Investigator's considerable involvement in the Diabetic Outpatient Clinic and the Diabetic Inpatient Ward.

### 4.3 Measures

Structured questionnaires, with consent forms for medical personnel and patients, were designed (Appendices A to E).

#### 4.3.1 Diabetes Attitude Scale (DAS-3)

The DAS-3 consists of 33 items, in 5 subscales, that measure: (1) the need for special training; (2) the seriousness of type 2 diabetes; (3) the value of tight control; (4) the psychosocial impact of diabetes; and (5) patient autonomy (Appendix A).<sup>16</sup> Reliability coefficients ranged between 0.65 (psychosocial impact) and 0.80 (seriousness),<sup>16</sup> slightly lower than Nunnally's recommendation.<sup>17</sup> Health providers who were more involved with diabetic patients had a more favourable attitude towards the disease than those who spent less time with diabetic patients; and the attitudes of nurses and dieticians were more positive than those of physicians, providing some support for the validity of the scale.<sup>16</sup>

### 4.3.2 Diabetes Practice Scale (DPS)

A 5-item practice scale was designed for registrars and medical officers (Appendix B). The items included screening for complications, level of glucose control required prior to discharge and diabetes educational themes.

### 4.3.3 Patient Questionnaire

A patient questionnaire was designed to ascertain the epidemiology of diabetes, in-hospital work-up; and to monitor screening, glucose control, education received, co-morbidity,<sup>18</sup> health-related quality of life (HRQOL)<sup>19-21</sup> and patient satisfaction (Appendices C, D and E).

## 4.4 Sample Size

Twenty registrars/medical officers were required to complete the DAS-3 and the DPS. Two groups of 30 patients in each group were recruited for completion of the patient questionnaire. The sample size was based on previous studies to demonstrate a difference before and after the intervention.

## 4.5 Procedure

Two medical students from Rotterdam (The Netherlands), with assistance from two trained multilingual black interviewers explained the patient information and informed consent. The students explained the procedures and the interviewers translate when it was necessary to ensure understanding by the patients as the forms and survey instruments were only available in English. Thereafter the patients were enrolled only after they have signed the informed consent document. The interviewers administered the HRQOL and

patient satisfaction measures.



study consisted of three patients

to evaluate the methodology.

The Principal Investigator (Helena Oosthuizen), with assistance from a diabetes educator and the medical students, was responsible for the Educational Intervention. Patients received a study number and remained anonymous regarding the care they have received. Structured questionnaires were used and stored in a MS Excel file. A questionnaire was completed for each week (Appendix F) to assess the burden on the health care system with regard to the number of patients managed in each firm, the number of doctors in each firm and the waiting times for referral.

The study was divided into three chronological sections. The first five weeks consisted of prospective follow-up of hospitalised patients with diabetes in the Department of Internal Medicine at the Pretoria Academic Hospital. A patient questionnaire was designed to ascertain the demography of diabetes and the health-related quality of life, as well as education received while the patients were in the hospital. This part of the study was conducted with the assistance of a trained, multilingual interviewer also fluent in several indigenous black languages. The in-hospital workup of the hospitalised patients regarding glucose control, bloodpressure control, screening for diabetic complications, co-morbidity<sup>9</sup> and treatment were evaluated. The co-morbidity index was done to assure that the two groups of patients assessed before and after the intervention were similar.

The second part of the study consisted of two educational intervention sessions. These sessions took place on two Thursday afternoons over two

consecutive weeks, each session lasting one and a half-hour. At the beginning of the first session, the attending doctors completed a Diabetes Attitude Scale (DAS-3) and a Diabetes Practice Scale (DPS). The DAS-3 consists of 33 items, in five sub-scales, that measures the following: the need for special training; the seriousness of type 2 diabetes; the value of tight control; the psychosocial impact of diabetes and patient autonomy. Reliability coefficients of the DAS-3 ranged, as quoted in the literature, between 0.65 (psychosocial impact) and 0.80 (seriousness)<sup>10</sup>. The DPS was designed for consultants, registrars and medical officers and consists of four open questions and seven treatment-related statements. The four open questions were: complication screening, contra-indications for 24-hour urine albumin assessment, optimal metabolic control in a diabetic patient and funduscopy outcomes and the need for referral to an ophthalmologist. Reference values for the optimal metabolic control in a diabetic patient were the clinical practice recommendations 2000 from the American Diabetes Association.<sup>11</sup> The registrars use the American Diabetes Association's Clinical Practice Recommendations<sup>11</sup> as part of their training programme and as this was a later publication than the 1997 South African Guidelines<sup>12</sup> this was used as reference. The original seventh treatment-related question involved the combination therapy of insulin-sensitising oral agents and sulphonylureas or insulin, but since insulin-sensitising oral agents were not available in South Africa at the time of the study, this question was changed to whether combination therapy of repaglinide and sulphonylureas was acceptable. Responses to the seven treatment-related statements were based on a five-point Likert scale ranging from one to five (strongly disagree to strongly agree).<sup>13</sup>

After completion of the questionnaires descriptive statistics of the hospitalised diabetic patients of the first five weeks were discussed. Thereafter an interactive session was held, during which the doctors could perform fundoscopies on three diabetic patients. With the aid of a slit lamp and video-screens, an ophthalmologist evaluated these patients while giving a description of lesions and its management. The specialist and attendants discussed the criteria for referral to an ophthalmologist of different fundoscopy outcomes.

The second intervention session consisted of a discussion on the screening and diagnosis of diabetes, metabolic goals and new trends in diabetes management. This was followed by a lecture on the complications of diabetes (nephropathy, vasculopathy, neuropathy and the diabetic foot). Thereafter a diabetic educator highlighted important aspects regarding patient education such as diet and the pathophysiology of diabetes. Finally the attendants completed the DAS-3 and DPS for the second time, in order to determine the impact of the education.

The third part of the study involved another five weeks of prospective hospitalised diabetic patients follow-up. The data collected from this group of patients was used to ascertain the effects of the educational intervention.

## 5. Data Analysis

Firstly descriptive statistics were calculated and documented. Thereafter, the reliability (internal consistency) of the measures was assessed. Paired t tests and analysis of covariance (ANCOVA) were used to ascertain intervention effects. T tests, correlation coefficients and ANCOVA were used to compare the two groups of patients. Proportions at baseline and pre- and post-intervention evaluation were compared with the Fisher exact test. Paired pre and post intervention DPS and DAS scores on doctors attending both intervention sessions were compared with the Wilcoxon sign rank test. A p - value < 0.05 is regarded as statistically significant.

There were 33 doctors at the first educational session and 31 doctors at the second intervention. This included doctors that were not working in the wards but in subspecialty departments. The results of the Diabetes Attitudes Scale (DAS-3) are shown in table 1.

6.1 Table 1

Results of the Diabetes Attitudes Scale (DAS-3) \*

Questions	Pre-intervention (N=23 doctors) Median (Quartiles)	Post-intervention (N=23 doctors) Median (Quartiles)	P-value (Wilcoxon matched pairs test)
Need for special training	4.2 (4.2 - 4.3)	4.3 (4.2 - 5.0)	0.07
Sensitiveness of DM	4.0 (3.8 - 4.6)	4.6 (4.0 - 4.9)	0.03
Value of tight control	4.3 (3.9 - 4.4)	4.4 (4.1 - 4.7)	0.45
Psychosocial impact of DM	4.0 (3.5 - 4.5)	4.0 (3.5 - 4.5)	0.22
Patient autonomy	3.8 (3.5 - 3.8)	3.8 (3.5 - 4.3)	0.07

\* Scale from one to five with five as the best score

## 6. Results:

A total of fourteen doctors worked in the Department of Internal Medicine during the first five weeks of follow-up (twelve registrars and two medical officers). Fifteen doctors worked in the wards during the second five weeks of follow-up (thirteen registrars and two medical officers) of whom eight had been present at both interventions.

There were three doctors who attended both interventions and worked in the wards during both phases one and two. Twenty-three doctors attended both the first and the second interventions and only their data were analysed.

There were 33 doctors at the first educational session and 31 doctors at the second intervention. This included doctors that were not working in the wards but in subspecialty departments. The results of the Diabetes Attitude Scale (DAS-3) are shown in table 1.

### 6.1 Table 1

Results of the Diabetes Attitude Scale (DAS-3).\*

Questions	Pre-intervention (N=23doctors) Median (Quartiles)	Post-intervention (N=23 doctors) Median (Quartiles)	P-value (Wilcoxon matched pairs test)
Need for special training.	4.2 (4.2 ; 4.8)	4.6 (4.2 ; 5.0)	0.07
Seriousness of DM.	4.0 (3.9 ; 4.6)	4.6 (4.0 ; 4.9)	0.03
Value of tight control.	4.3 (3.9 ; 4.4)	4.4 (4.1 ; 4.7)	0.45
Psychosocial impact of DM.	4.0 (3.8 ; 4.5)	4.0 (3.8 ; 4.5)	0.22
Patient autonomy.	3.6 (3.5 ; 3.9)	3.8 (3.5 ; 4.3)	0.07

\* Scale from one to five with five as the best score.



Pre and post intervention DAS-3 compared in those attending both sessions only (n = 23). All five sub-scales showed an improvement. Statistical analysis pointed to significant differences in attitude regarding seriousness of diabetes mellitus (p = 0.03), while the DAS-3 score of need for special training and patient autonomy indicated a borderline significant improvement (p = 0.07).

As shown in table 2 the doctors' score on complication screening, importance of glycaemic control and insulin resistance and combination therapy with Repaglinide decreased. Only the latter difference was statistically significant (p = 0.04).

The other items of the Diabetes Practice Scale (DPS) improved, of which four were statistically significant: contraindication for 24-hour urine albumin sample (p < 0.01), optimal metabolic control in a diabetic patient (p = 0.01), progressiveness of disease (p = 0.04) and avoidance of progression of type 2 diabetes (p = 0.04).

## 6.2 Table 2.

### Results of Diabetes Practice Scale (DPS).

Questions	Pre-intervention (N=23 doctors)	Post-intervention (N=23 doctors)	Change	P-value (Wilcoxon matched pairs test)
Component (maximum points for question)	Mean (SD)	Mean (SD)	Mean (SD)	
Complication screening. (10)	5.80 (1.27)	5.80 (1.48)	0.00 (1.96)	0.88
Contraindications for 24-hour urine albumin sample. (6)	0.52 (0.90)	1.70 (1.11)	1.17 (1.07)	<0.01
Optimal metabolic control in a diabetic patient. (9)	3.83 (1.99)	5.04 (1.50)	1.21 (2.11)	0.01
Funduscopy outcomes and need of referral. (11)	4.57 (1.41)	5.22 (1.00)	0.65 (1.03)	0.01
Effectiveness of oral agents. *	2.17 (1.07)	2.00 (0.67)	0.17 (0.83)	0.27
Progressiveness of disease. †	3.22 (1.24)	3.96 (0.88)	0.74 (1.42)	0.03
Importance of glycaemic control. *	1.96 (1.22)	2.04 (1.55)	0.09 (1.53)	0.78
Importance of insulin resistance. *	1.23 (0.43)	1.41 (0.73)	0.18 (0.59)	0.18
Glycaemic control and advancing age. *	1.65 (0.78)	1.48 (0.51)	0.17 (0.72)	0.25
Avoidance of progression of type 2 diabetes. †	2.04 (0.93)	2.78 (1.31)	0.74 (1.51)	0.04
Combination therapy with Repaglinide. *	3.45 (0.80)	3.86 (0.71)	0.41 (0.80)	0.04

\* Scale from one to five with one as the best score.

† Scale from one to five with five as the best score.

Table 3 shows the upper limits of metabolic and blood pressure values as given by the doctors in this DPS question: optimal metabolic control in a diabetic patient. Answers regarding pre- and post-intervention values of LDL-cholesterol ( $p = 0.01$ ), systolic ( $p = 0.02$ ) and diastolic blood pressure ( $p = 0.01$ ), changed significantly.

### 6.3 Table 3

Optimal Metabolic and Blood Pressure Control as Reported by the Doctors

Question	Pre-intervention (N=23 doctors)	Post-intervention (N=23 doctors)	Change P-value	Wilcoxon matched pairs test (p-value)
	Mean (SD)	Mean (SD)	Mean (SD)	
HbA1c (%)	6.98 (0.98)	6.95 (0.38)	0.03 (0.88)	0.83
Total cholesterol (mmol/l)	4.56 (0.50)	4.56 (0.59)	0.04 (0.62)	0.98
LDL cholesterol (mmol/l)	2.93 (0.62)	2.55 (0.55)	0.39 (0.84)	0.01
Fasting glucose (mmol/l)	6.53 (1.17)	6.52 (0.59)	0.01 (1.10)	0.80
Postprandial glucose (mmol/l)	9.97 (1.37)	9.29 (1.21)	0.68 (1.64)	0.08
Bedtime glucose (mmol/l)	8.41 (2.07)	8.81 (1.54)	0.40 (2.22)	0.45
Systolic blood pressure (mmHg)	123.8 (7.77)	128.4 (6.64)	4.57 (8.11)	0.02
Diastolic blood pressure (mmHg)	80.6 (4.35)	83.6 (3.42)	2.96 (4.75)	0.01

In the first five weeks of the follow-up (phase 1), thirty-one patients were included in the study of which two died. Four patients were excluded. One of them refused to participate in the study. From the two minors that were enrolled in the study, permission was not obtainable from their parents or legal guardians. One patient was unable to answer questions.

In the second five weeks of the follow-up (phase 2), thirty-two patients were included in the study. Seven patients were excluded. Two patients refused participation, two minors from whom permission could not be obtained and three patients were unable to answer questions.

Table 4 shows that the baseline characteristics of the study population did not differ significantly between phase 1 and phase 2.

**6.4 Table 4.**

**Baseline Characteristics of the Study Population**

Variable	Phase 1	Phase 2	P-value
	(N=31 patients)	(N=32 patients)	
	<b>Mean (SD)</b>	<b>Mean (SD)</b>	
Age	52 (18.6)	50 (16.7)	0.63
	<b>Median (range)</b>	<b>Median (range)</b>	
Charlson comorbidity index	2.17 (1.23)	2.16 (1.27)	0.84
	<b>Number (%)</b>	<b>Number (%)</b>	
Male	14 (45.2)	16 (50.0)	0.80
Type 2 diabetes	19 (61.3)	18 (56.3)	0.80
Previous clinic:			0.27
Diabetic outpatient clinic	10 (32.3)	6 (18.8)	
Other clinic / hospital	16 (51.6)	16 (50.0)	
None	5 (16.1)	10 (31.3)	
Reason for admission :			0.66
New or uncontrolled DM	16 (51.6)	20 (62.5)	
Complicated DM	7 (22.6)	5 (15.6)	
Coincidental DM	8 (25.8)	7 (21.9)	

Table 5.

Table 5 gives a description of the patient work-up. During the second five weeks, the doctors performed significantly better for foot-neuropathy assessments ( $p = 0.03$ ) than during the first five weeks. Doctors also performed more fundoscopies or referred to an ophthalmologist more often ( $p = 0.04$ ). Furthermore, there was a significant increase in therapeutic changes ( $p = 0.01$ ) and educated patients ( $p = 0.01$ ).

The patient satisfaction did not change statistically significantly when comparing patients admitted before and after the intervention.

Test done	13 (41.9)	18 (56.2)	0.32
Mean glucose value over the last eight-hour hours before discharge	14 (45.2)	18 (56.2)	0.45
funduscopy	3 (9.7)	3 (9.4)	1.00
referral to ophthalmologist	1 (3.2)	4 (12.5)	0.03
Therapy adjusted	14 (43.2)	23 (71.9)	0.01
Therapy not adjusted	9 (28.1)	9 (28.1)	
patient educated	15 (46.4)	6 (18.6)	0.01
not educated	13 (41.9)	23 (71.9)	
patient educated by			
Doctor	3 (9.7)	1 (3.1)	0.07
other staff	7 (22.6)	14 (43.8)	
both doctor and other	3 (9.7)	7 (21.9)	

Mean glucose value over the last eight-hour hours before discharge.

† Doctor, nurse or student

## Work-Up of Study Population

Variable	Phase 1	Phase 2	P-value
	(N=31)	(N=32)	
	Mean (SD)	Mean (SD)	
Mean glucose (mmol/l) *	10.4 (3.4)	9.9 (3.0)	0.49
	Number (%)	Number (%)	
HbA1c :			
Test done	13 (41.9)	18 (56.3)	0.32
Urine albumin :			
Test done	6 (19.4)	6 (18.8)	1.00
Fundoscopy :			
Test done	14 (45.2)	18 (56.3)	0.45
Foot-vascular assessment :			
Test done	3 (9.7)	3 (9.4)	1.00
Foot-neuropathy assessment			
Test done	1 (3.2)	8 (25.0)	0.03
Therapy change :			
Therapy not adjusted	15 (48.4)	6 (18.8)	0.01
Therapy adjusted	14 (45.2)	25 (78.1)	
Patient educated :			
not educated	15 (48.4)	6 (18.8)	0.01
educated	13 (41.9)	23 (71.9)	
Patient educated by :			
Doctor	3 (9.7)	1 (3.1)	0.07
other †	7 (22.6)	14 (43.8)	
both doctor and other	3 (9.7)	7 (21.9)	

\* Mean glucose value over the last eighty-four hours before discharge.

† Dietician, nurse or student.

## 7. Conclusion

This study demonstrates that the knowledge and attitudes regarding diabetes, as measured with the DAS-3 and DPS, improved after the doctors attended the educational intervention. On the DAS-3 scale only the section on seriousness of type 2 diabetes showed a statistically significant change. The scores of need for special training and patient autonomy showed a non-significant trend towards improvement. The doctors scored the lowest on the questions regarding patient autonomy.

The upper-limits of the metabolic and blood pressure values in a diabetic patient, as given by the doctors, closely matched with the reference values.<sup>11</sup> After the intervention the work-up of patients in the hospital improved in a number of aspects.

Notably there was an increase in the number of foot neuropathy assessments performed after the intervention. A possible reason for improvement in the neurological assessments could have been that during the educational intervention the doctors were instructed how to use a monofilament and every doctor were given a monofilament. The number of foot vascular assessments remained at a low level. Possible reasons for this could be: no practical demonstration on evaluation of the peripheral vascular status and underreporting (assessments could have been done, but were not recorded in the file). The latter is a distinct possibility as the bedletter may mention "normal cardiovascular examination without referring to peripheral pulses specifically.

## 8. Discussion

The best type of study to perform in the ideal situation would have been a well-conducted randomised controlled trial (RCT). This removes allocation bias, and, although it does not guarantee that the groups will be identical, any differences between them are attributable to chance, and statistical methods are available to measure the probability that the observed differences in the outcome variables are due to chance.<sup>29</sup> In non-randomised studies adjustment need to be performed but cannot approximate the prognostic balance of randomisation.<sup>30</sup> One of the practical restrictions was that there was only access to one Academic Tertiary Care Centre and that the models between different Tertiary Care Centres differ so much that another centre could not be used for comparison. Another problem is financial restrictions.<sup>27</sup> It was also not possible to randomise doctors to either an intervention or no intervention as it would not have been possible to perform this in a double-blind method and due to small numbers all the doctors attended the academic sessions where the intervention was delivered. RCT evidence can focus clinicians on diagnosis-based interventions rather than on the development of individualised intervention strategies.<sup>28</sup>

The pre-and post-intervention study method was used as this was in the circumstances the best model to use. Another factor apart from the intervention could however have been responsible for the improvement in quality of care delivered to diabetic patients. One possibility could have been the Hawthorne effect although the doctors were not aware of when the evaluation of hospitalised patients would take place. The advantage was that allocation bias was not a problem as “comparable treatment groups” were studied.



The initial aim of sixty patients in the study was achieved. Although the sample was sufficient for our goals, a larger population sample would have been better. However, this number of diabetic patients evaluated accounts for seventeen percent (17%) of the total annual diabetic patients hospitalised in the Department of Internal Medicine. This probably reflects a representative sample of patients admitted during the year. Twenty-three doctors attended both the first and second intervention. The doctors during the first phase of the evaluation were not the same as those during the third phase of the evaluation. Neither did the treating doctors all attend the intervention sessions.

The ideal expectation was that the doctors present at the first and second interventions were the same and was also working in the same wards during phase 1 and phase 2. Unfortunately, this was not the case and this may have diluted the effect of the intervention. However the doctors would have been biased if they were informed that they had to stay in the same wards for the evaluation of the intervention. Because the second DAS-3 and DPS were completed immediately after the second intervention, only the short-term effect of the intervention on the attitude and knowledge could be measured. During the first five weeks of follow-up, the doctors did not know the exact aim of the study and thus were not influenced in their patient work-up. After the intervention, the doctors were aware of the control of their work-up and it is unsure if the improved work-up will be continued after this study. There is a great diversity of languages in South Africa and a multilingual interpreter helped some patients not proficient in either English or Afrikaans.

To our knowledge, few other studies have reported on a study of this nature, making it difficult to compare our results with other studies. An earlier study by Sharp and co-workers also used the Diabetes Attitude Scale and the seven treatment-related statements we used in the Diabetes Practice Scale.<sup>10</sup>

Because we used the latest version of the DAS (DAS-3) we cannot compare all the results with this earlier study. Only two sub-scales were similar in both versions. The change in attitudes towards need for special training and patient autonomy in the other study<sup>10</sup> showed a statistical significant difference but in our study both did not reach a significance. The attitudes toward the seriousness of type 2 diabetes changed significantly in our study. The number of patients educated changed significantly due to the fact that the doctors were sensitised to this by the lecture given by the diabetic educator and if they did not give the education themselves they referred the patient to a dietician or sister to provide the patient with education on diabetes.

The patient satisfaction did not improve statistically significantly due to the fact that the patients started with a very high score before the intervention. The patients were even before the intervention very satisfied with the care that they were receiving. Thus there were no room to demonstrate any improvement.

Medical personnel could benefit from intensified training on different aspects regarding the care of a diabetic patient and therefore improve their levels of patient care due to better understanding of the disease, increased knowledge and changes in attitudes towards diabetic patients.

In conclusion, a short educational intervention resulted in some improvement in attitude, knowledge and patient work-up in the Pretoria Academic Hospital. Further research is needed to evaluate the long-term effects of such an educational intervention. This study emphasizes the need for outcome based continuing medical education of medical personnel.

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Dear Prof/Dr \_\_\_\_\_

#### THE NATURE AND PURPOSE OF THIS STUDY

I understand that I am being asked to take part in a research study. The overall aim of this study is to investigate the effect of a medical educational intervention on attitudes, practice and patient satisfaction.

#### EXPLANATION OF PROCEDURES TO BE FOLLOWED

For this study we would like you to complete the Diabetes Attitude Scale (DAS-3) and the Diabetes Practice Scale (DPS).

#### 3. RISK AND DISCOMFORT INVOLVED

There is no risk and discomfort involved in this study.

#### 4. POSSIBLE BENEFITS OF THIS STUDY

This study will provide a better understanding of the concerns and problems faced by health personnel and diabetic patients and guidance for planners and policymakers for improving the quality of health care.

#### 5. INFORMATION

If you have any questions concerning this study, you should contact Dr Heleen Oosthuizen (Tel: (012) 354 2354) of the Department Internal Medicine, Faculty of Health Sciences, University of Pretoria.

## 10. Attachments

### 10.1 Appendix A

#### Informed Consent to Health Care Professionals

##### AUTHORISATION TO PARTICIPATE IN A RESEARCH PROJECT.

TITLE OF STUDY: In-hospital quality of care for diabetes mellitus in relation to patient satisfaction: an intervention study.

Dear Prof/Dr/.....date...../...../.....

##### THE NATURE AND PURPOSE OF THIS STUDY.

I understand that I am being asked to take part in a research study. The overall aim of this study is to investigate the effect of a medical educational intervention on attitudes, practice and patient satisfaction.

##### EXPLANATION OF PROCEDURES TO BE FOLLOWED.

For this study we would like you to complete the Diabetes Attitude Scale (DAS-3) and the Diabetes Practice Scale (DPS).

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There is no risk and discomfort involved in this study.

##### 4. POSSIBLE BENEFITS OF THIS STUDY.

This study will provide a better understanding of the concerns and problems faced by health personnel and diabetic patients and guidance for planners and policymakers for improving the quality of health care.

##### 5. INFORMATION

If you have any questions concerning this study, you should contact: Dr Helena Oosthuizen (Tel: (012) 354 2354 of the Department Internal Medicine, Faculty of Health Sciences, University of Pretoria.



## 6. VOLUNTARY PARTICIPATION

Participation in this study is voluntary. No compensation for participation will be given. You are free to withdraw your consent to participate in this study at any time. Refusing to participate will involve no penalty or loss of benefits.

## 7. CONFIDENTIALITY.

All records obtained in this study will be regarded as confidential. Results will be published or presented in such a fashion that no person will be identified by name.

## 8. CONSENT TO PARTICIPATE IN THIS STUDY.

I have read the above information before signing this consent form. The content and meaning of this information have been explained to me. I have been given the opportunity to ask questions and am satisfied that they have been answered satisfactorily. I hereby volunteer to take part in this study. I have received a signed copy of this informed consent agreement.

.....  
 Interviewee signature Date

.....  
 Witness Date

.....  
 Witness Date

## 10.2 Appendix B

### Diabetes Attitude Scale

Please rate for the following items whether you strongly agree (SA), agree (A), neutral (N), disagree (D) or strongly disagree (SD) by placing a cross on your most appropriate response.

In general I believe that:

1	Health care professionals who treat people with diabetes should be trained to communicate well with their patients	SA	A	N	D	SD
2	People who do not need to take insulin to treat their diabetes have a pretty mild disease	SA	A	N	D	SD
3	There is not much use in trying to have good blood sugar control because the complications of diabetes will happen anyway	SA	A	N	D	SD
4	Diabetes affects almost every part of a diabetic person's life	SA	A	N	D	SD
5	The important decisions regarding daily diabetes care should be made by the person with diabetes	SA	A	N	D	SD
6	Health care professionals should be taught how daily diabetes care affects patients' lives	SA	A	N	D	SD
7	Older people with Type II diabetes do not usually get complications	SA	A	N	D	SD
8	Keeping the blood sugar close to normal can help prevent the complications of diabetes	SA	A	N	D	SD
9	Most people can enjoy life and still keep tight blood sugar control	SA	A	N	D	SD
10	Health care professionals should help patients make informed choices about their care plans	SA	A	N	D	SD
11	It is important for the nurses and dieticians who teach people with diabetes to learn counselling skills	SA	A	N	D	SD
12	People whose diabetes is treated by just a diet do not have to worry about getting many long-term complications	SA	A	N	D	SD

13	Almost everyone with diabetes should do whatever it takes to keep their blood sugar close to normal	SA	A	N	D	SD
14	The emotional effects of diabetes are pretty small	SA	A	N	D	SD
15	People with diabetes should have the final say in setting their blood glucose goals	SA	A	N	D	SD
16	Blood sugar testing is not needed for people with Type II diabetes	SA	A	N	D	SD
17	Low blood sugar reactions make tight control too risky for most people	SA	A	N	D	SD
18	Health care professionals should learn how to set goals with patients, not just tell them what to do	SA	A	N	D	SD
19	Diabetes is hard because you never get a break from it	SA	A	N	D	SD
20	The person with diabetes is the most important member of the diabetes care team	SA	A	N	D	SD
21	To do a good job, diabetes educators should learn a lot about being teachers	SA	A	N	D	SD
22	Type II diabetes is a very serious disease	SA	A	N	D	SD
23	Having diabetes changes a person's outlook on life	SA	A	N	D	SD
24	People who have Type II diabetes will probably not get much payoff from tight control of their blood sugars	SA	A	N	D	SD
25	People with diabetes should learn a lot about the disease so that they can be in charge of their own diabetes care	SA	A	N	D	SD
26	Type II diabetes is as serious as Type I diabetes	SA	A	N	D	SD
27	Tight control is too much work	SA	A	N	D	SD
28	A person with diabetes can lead a normal life	SA	A	N	D	SD
29	What the patient does has more effect on the outcome of diabetes care than anything a health professional does	SA	A	N	D	SD
30	Tight control of blood sugar makes sense only for people with Type I diabetes	SA	A	N	D	SD
31	It is frustrating for people with diabetes to take care of their disease	SA	A	N	D	SD
32	People with diabetes have a right to decide how hard	SA	A	N	D	SD

10.3	they will work to control their blood sugar					
33	People who take diabetes pills should be as concerned about their blood sugar as people who take insulin	SA	A	N	D	SD
34	People with diabetes have the right <u>not</u> to take good care of their diabetes	SA	A	N	D	SD
35	Support from family and friends is important in dealing with diabetes	SA	A	N	D	SD

2 Under which circumstances would you not perform a 24 hour urine collection?

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---



---

3 What would you regard as optimal values for the following in a diabetic patient?

HbA <sub>1c</sub>	
Total Cholesterol	
LDL Cholesterol	
Fasting glucose	
Postprandial glucose	
Bedtime glucose	
BP	

4 Match the following 2 columns – the right column can have more than 1 connection

- Hard exudates
- Multiple Cotton wool spots
- Micro-aneurysms
- referral
- Cataracts
- Dix and Ditz Mesotopia
- Vitreous haemorrhage
- Neovascularisation
- Maculopathy
- Retinal detachment

- Refer urgently
- Does not need urgent but as soon as possible
- Does not need referral to an ophthalmologist

**Practice Questionnaire**

To be completed by medical officers, registrars, interns and consultants.

1 List 4 diabetic complications you would screen for in hospitalised diabetic patients and mention how would you screen for it.

-----  
 -----  
 -----  
 -----

2 Under which circumstances would you not perform a 24 hour urine collection?

-----  
 -----  
 -----

3 What would you regard as optimal values for the following in a diabetic patient?

HbA <sub>1c</sub>	
Total Cholesterol	
LDL Cholesterol	
Fasting glucose	
Postprandial glucose	
Bedtime glucose	
BP	

4 Match the following 2 columns – the right column can have more than 1 connection

Hard exudates  
 Multiple Cottonwool spots  
 Micro-aneurisms  
 referral  
 Cataracts  
 Dot and blot bleedings  
 Vitreous haemorrhage  
 Neovascularization  
 Maculopathy  
 Retinal detachment

Refer urgently  
 Does not need urgent but as soon as possible  
 Does not need referral to an ophthalmologist

5 What is the colour of the Mydriacil bottle's lid? \_\_\_\_\_

6 What are the 5 most important aspects on which a diabetic patient should be educated?

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7 Complete the following table

	Strongly Disagree =1	Disagree = 2	Not sure = 3	Agree = 4	Strongly Agree =5
1. All oral agents used to treat type 2 diabetes are equally effective					
2. Diabetes is a progressive disease that requires increasing numbers of therapies or doses of agents to control it over time.					
3. It is not important for people with diabetes to maintain HbA <sub>1c</sub> levels of $\leq 7\%$					
4. Clinicians should not be concerned about insulin-resistant patients since they do not have frank diabetes					
5. It is better for the patient's long term health to allow glucose to rise with age rather than increase dosages or numbers of agents					
6. The progressive worsening of type 2 diabetes over time (as the patient ages) cannot be avoided.					
7. Repaglinide offers advantages to patients with type 2 diabetes when used in combination with sulfonylureas					

## 10.4 Appendix D

### Informed Consent of Patients

AUTHORISATION TO PARTICIPATE IN A RESEARCH PROJECT.

TITLE OF STUDY: **In-hospital quality of care for diabetes mellitus in relation to patient satisfaction: an intervention study.**

Dear Mr/Mrs/Ms.....date...../...../.....

#### 1. THE NATURE AND PURPOSE OF THIS STUDY.

I understand that I am being asked to take part in a research study. The overall aim of this study is to investigate the effect of a medical educational intervention on attitudes, practice and patient satisfaction.

#### 2. EXPLANATION OF PROCEDURES TO BE FOLLOWED.

For this study we shall ask some personal questions concerning yourself. The questions will be asked in a language that you understand.

#### 3. RISK AND DISCOMFORT INVOLVED.

For this study only questions will be asked. Some questions are of a personal nature.

#### 4. POSSIBLE BENEFITS OF THIS STUDY.

This study will provide a better understanding of the concerns and problems faced by diabetic patients and guidance for planners and policymakers for improving the quality of health care.

#### 5. INFORMATION

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

Dr H Oosthuizen (Tel: (012) 3542354) or Prof P. Rheeder of the Clinical Epidemiology Unit, University of Pretoria.

#### 6. VOLUNTARY PARTICIPATION

Participation in this study is voluntary. No compensation for participation will

be given. You are free to withdraw your consent to participate in this study at any time. Refusing to participate will involve no penalty or loss of benefits.

7. CONFIDENTIALITY.

All records obtained in this study will be regarded as confidential. Results will be published or presented in such a fashion that no person will be identified by name.

8. CONSENT TO PARTICIPATE IN THIS STUDY.

I have read or had read to me in a language that I understand the above information before signing this consent form. The content and meaning of this information have been explained to me. I have been given the opportunity to ask questions and am satisfied that they have been answered satisfactorily. I hereby volunteer to take part in this study. I have received a signed copy of this informed consent agreement.

.....  
Interviewee signature

.....  
Date

.....  
Parent or legal guardian signature

.....  
Date

.....  
Witness

.....  
Date

.....  
Witness

.....  
Date

(To be completed by medical student/research assistant)



10.5 Appendix E

Patient Demographic Information

Study number: \_\_\_\_\_

Gender \_\_\_\_\_

Ethnic Group \_\_\_\_\_

Age \_\_\_\_\_

Address

Previous clinic/Dr responsible for the patient's diabetes care:

\_\_\_\_\_

Type of DM: (type 2= diagnosed after age 30 and not on Insulin within first year of diagnosis):

Patient proficient in Afrikaans or English Yes  No

Reason for admission \_\_\_\_\_  
\_\_\_\_\_

Treating Doctors Consultant \_\_\_\_\_ MO/Registrar: \_\_\_\_\_

Intern: \_\_\_\_\_

Ward \_\_\_\_\_ Hospital \_\_\_\_\_

Treatment Prior to admission  
\_\_\_\_\_

Treatment at time of admission  
\_\_\_\_\_

Treatment at time of discharge  
\_\_\_\_\_

10.5 Appendix E



Patient Demographic Information

Study number: \_\_\_\_\_

Gender \_\_\_\_\_

Ethnic Group \_\_\_\_\_

Age \_\_\_\_\_

Address

Previous clinic/Dr responsible for the patient's diabetes care:

\_\_\_\_\_

Type of DM: (type 2= diagnosed after age 30 and not on Insulin within first year of diagnosis):

Patient proficient in Afrikaans or English Yes  No

Reason for admission \_\_\_\_\_  
\_\_\_\_\_

Treating Doctors Consultant \_\_\_\_\_ MO/Registrar: \_\_\_\_\_

Intern: \_\_\_\_\_

Ward \_\_\_\_\_ Hospital \_\_\_\_\_

Treatment Prior to admission  
\_\_\_\_\_

Treatment at time of admission  
\_\_\_\_\_

Treatment at time of discharge  
\_\_\_\_\_

**Screening:**

Done by: \_\_\_\_\_

(1) Fundoscopy Yes/No Dilated  no  unsure

refer to Ophthalmology Yes/No

(2) 24 h urine albumin or micral Yes/No result (mg/l): \_\_\_\_\_

(3) foot-vascular-assessment DP felt Yes/No side absent:

TP felt Yes/No side absent:

(4) foot-neuropathy assessment:

General comment only:

normal/abnormal

Specified: Vibration Yes/No:

result:.....

Monofilament Yes/No:

result:.....

Cotton wool Yes/No:

result:.....

Pinprick Yes/No:

result:.....

(5) HbA<sub>1c</sub> Yes/No: result:.....

(6) Control:

Number of glucose values last 48 hours prior to discharge:

Values:

Days in hospital

Dead

Alive

**(7) Referrals:** \_\_\_\_\_ Process \_\_\_\_\_

**Dr or clinic** \_\_\_\_\_

**Date** \_\_\_\_\_

**Special referrals eg eyes:** \_\_\_\_\_

**Date** \_\_\_\_\_

1) During your stay in hospital did anyone tell you more about diabetes or how to treat it? Yes/No

2) if yes: who told you this Doctor, Intern, Student, Sister in Charge, Nurse, Diabetic Clinic Sister, Dietician, Social worker, Other: \_\_\_\_\_

3) What did they tell you (identify theme):

Knowledge appropriate (yes/no)

Nature of disease \_\_\_\_\_

Treatment and control \_\_\_\_\_

Diet \_\_\_\_\_

Injection technique and devices \_\_\_\_\_

Complications \_\_\_\_\_

Foot care \_\_\_\_\_

Home monitoring \_\_\_\_\_

Hypoglycaemia: \_\_\_\_\_

Recognition and management: \_\_\_\_\_

Sick day management: \_\_\_\_\_

Other \_\_\_\_\_

**Patient Education Process**

On day of discharge the research assistant will ask the patient whether he/she was given any education on diabetes. The assistant will note 1) by whom education was given 2) what topic was covered and 3) whether there was sufficient understanding of the topic.

- 1) During your stay in hospital did anyone tell you more about diabetes or how to treat it? **Yes/No**
- 2) If yes: who told you this: **Doctor, Intern, Student, Sister in Charge, Nurse, Diabetic Clinic Sister, Dietician, Social worker, Other:** \_\_\_\_\_

3) What did they tell you (identify theme):	Knowledge appropriate (yes/no)
Nature of disease _____	_____
Treatment and control _____	_____
Diet _____	_____
Injection technique and devices _____	_____
Complications _____	_____
Foot care _____	_____
Home monitoring _____	_____
Hypoglycaemia: _____	_____
Recognition and management: _____	_____
Sick day management: _____	_____
Other _____	_____

# 10.7 Appendix G

## The Charlson Comorbidity Index

### Weighted index of Comorbidity

<u>Assigned Weights</u>	Good	Good	Fair	Poor	<u>Conditions</u>
1	For how long of all day has your health limited your activities?				Myocardial infarction Congestive heart failure Peripheral vascular disease Cerebrovascular disease Dementia COPD Connective tissue disease Ulcer disease Mild liver disease Diabetes Hemiplegia
2	A The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports				Moderate or severe renal disease Diabetes with end-organ damage Any tumour Leukaemia Lymphoma
	B The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries or bowling				
3	C Walking uphill or climbing a few flights of stairs				Moderate or severe liver disease Metastatic solid tumour AIDS
	D Bending, lifting, or stooping				
6	E Walking one block				
	F Eating, dressing, bathing, or using the toilet				
3 How much bodily pain have you had during the past 6 months?					
None Very Mild Mild Moderate Severe Very Severe					
4 Does your health keep you from working at a job, doing the house or going to school?					
Yes, for more than 3 months Yes, for 3 months or less No					

## 10.8 Appendix H

### Health-Related Quality of Life

1. In general, would you say your health is:

Excellent	Very Good	Good	Fair	Poor
-----------	-----------	------	------	------

2. For how long (if at all) has your health limited you in each of the following activities?

		More than 3 months	3 Months or less	Not limited at all
A	The kinds or amounts of vigorous activities you can do, like lifting heavy objects, running or participating in strenuous sports			
B	The kinds or amounts of moderate activities you can do, like moving a table, carrying groceries or bowling			
C	Walking uphill or climbing a few flights of stairs			
D	Bending, lifting, or stooping			
E	Walking one block			
F	Eating, dressing, bathing, or using the toilet			

3. How much bodily pain have you had during the past 4 weeks?

None	Very Mild	Mild	Moderate	Severe	Very Severe
------	-----------	------	----------	--------	-------------

4. Does your health keep you from working at a job, doing work around the house or going to school?

Yes, for more than 3 months	Yes, for 3 months or less	No
-----------------------------	---------------------------	----

5. Have you been unable to do certain kinds or amounts of work, housework or schoolwork because of your health?

Yes, for more than 3 months	Yes, for 3 months or less	No
-----------------------------	---------------------------	----

		of the time	of the time	A good bit of the time	Some of the time	A little of the time	None of the time
6	How much of the time, during the past month, has your health limited your social activities (like visiting with friends or close relatives)?						
7	How much of the time, during the past month, have you been a very nervous person?						
8	During the past month, how much of the time have you felt calm and peaceful?						
9	How much of the time, during the past month, have you felt downhearted and blue?						
10	During the past month, how much of the time have you been a happy person?						
11	How often, during the past month, have you felt so down in the dumps that nothing could cheer you up?						

12. **Definitely** **Mostly** **Not** **Mostly** **Definitely**  
**True** **True** **Sure** **False** **False**
- A. I am somewhat ill
- B. I am as healthy as anybody I know
- C. My health is excellent
- D. I have been feeling bad lately



13. Do you have any long standing illness, disability or infirmity? \_\_\_\_\_

If yes, what is it? \_\_\_\_\_

14. Degree of disability	no disease	1
	non-limiting disease	2
	has to take care	3
	limited in activity/mobility	4
	unable to work or walk outdoors	5
	Requires help with activities of daily living	6

15. Have you had any of the following problems over the last month?

Sleep problems \_\_\_\_\_

Concentration difficulties \_\_\_\_\_

Nervous problems \_\_\_\_\_

Worrying over every little thing \_\_\_\_\_

Always tired \_\_\_\_\_

Headaches \_\_\_\_\_

Constipation \_\_\_\_\_

Fainting/dizziness \_\_\_\_\_

Sickness/nausea \_\_\_\_\_

Palpitations (heart beating rapidly) \_\_\_\_\_

Back trouble \_\_\_\_\_

Persistent cough \_\_\_\_\_

Colds/flu \_\_\_\_\_

Bladder/kidney problems \_\_\_\_\_

Stiff/painful joints \_\_\_\_\_

Sinus/catarrh/blocked nose \_\_\_\_\_

Trouble with eyes \_\_\_\_\_

Trouble with ears \_\_\_\_\_

Other (please specify) \_\_\_\_\_

### Patient Satisfaction Questionnaire

Please rate how satisfied you are with the following aspects of your health care from very dissatisfied (VD) to very satisfied (VS).

(numbering continue from Health-Related Quality of Life as this is part of patient profile)

16. Friendly providers	VD	D	N	S	VS
17. Encouraging providers	VD	D	N	S	VS
18. Helpful providers	VD	D	N	S	VS
19. Respectful providers	VD	D	N	S	VS
20. Considerate providers	VD	D	N	S	VS
21. Providers who listen to me	VD	D	N	S	VS
22. Supportive providers	VD	D	N	S	VS
23. Providers who let me talk	VD	D	N	S	VS
24. Providers who let me know what is expected	VD	D	N	S	VS
25. Competent providers	VD	D	N	S	VS
26. The consistency of the Information	VD	D	N	S	VS
27. Communication understandable	VD	D	N	S	VS
28. Maintenance of contact	VD	D	N	S	VS
29. Follow-up service	VD	D	N	S	VS
30. Fair (equal treatment)	VD	D	N	S	VS
31. Available at suitable times for me	VD	D	N	S	VS
32. Availability of a toilet	VD	D	N	S	VS
33. Cleanliness of the place	VD	D	N	S	VS
34. Privacy during consultation	VD	D	N	S	VS
35. Thoroughness of examination	VD	D	N	S	VS

36. Cost of attendance		D	N	S	VS
37. The medicine I get	VD	D	N	S	VS
38. Convenience of the service	VD	D	N	S	VS

Week: ...../...../20.....

on Tuesday

No of Patients in Monday firm:.....

Drs in Monday firm: interns.....MOs.....Registrars....

on Wednesday

No of Patients in Tuesday firm:.....

Drs in Tuesday firm: interns.....MOs.....Registrars....

on Thursday

No of Patients in Wednesday firm:.....

Drs in Wednesday firm: interns.....MOs.....Registrars....

on Friday

No of Patients in Thursday firm:.....

Drs in Thursday firm: interns.....MOs.....Registrars....

Current referral flow, assessed each Friday: earliest appointment.

To foot clinic...../...../00

To eye clinic if urgent...../...../00

To eye clinic if non-urgent...../...../00

To DM clinic...../...../00

Data Pertaining to Workload.

To be completed by medical students weekly.

Week:...../...../00 to ...../...../00

on Tuesday

No of Patients in Monday firm:.....

Drs in Monday firm: Interns.....MOs.....Registrars....

on Wednesday

No of Patients in Tuesday firm:.....

Drs in Tuesday firm: Interns.....MOs.....Registrars...

on Thursday

No of Patients in Wednesday firm:.....

Drs in Wednesday firm: Interns.....MOs.....Registrars...

on Friday

No of Patients in Thursday firm:.....

Drs in Thursday firm: Interns.....MOs.....Registrars...

Current referral time: assessed each Friday: earliest appointment.

To foot clinic...../...../00

To eye clinic if urgent...../...../00

To eye clinic if non-urgent...../...../00

To DM clinic...../...../00