

**The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital**

Mini-dissertation

**By**

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**RESEARCH ETHICS COMMITTEE**

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## ABSTRACT

**Title: The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital**

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**Department: Social Work and Criminology**

**Degree: MSW (Healthcare)**

**Supervisor: Dr. C.L. Carbonatto**

Approximately 6.5 million people have been diagnosed with diabetes in South Africa. Despite current medical interventions, the number of newly diagnosed individuals continues to rise. Lifestyle intervention has been widely used to improve the treatment outcomes of type 2 diabetic patients.

This study aimed at evaluating the effect of lifestyle intervention on Type 1 diabetic patients within the context of Kalafong Hospital, a public hospital in South Africa. The study took place within Kalafong Hospital and looked specifically at lifestyle intervention, as lifestyle itself is a crucial part in the management of diabetes. The observations that the majority of patients receiving treatment from the Diabetes Clinic at Kalafong Hospital (found through observation and by looking at the diabetic clinic patient database) showed continued elevated blood sugar, despite pharmaceutical care. The finding that patients were observed as passive recipients of care and the knowledge that, in 2007 alone, 20 139 citizens died as a result of diabetes, led the researcher to investigate whether lifestyle intervention could improve the motivation of Type 1 diabetic patients (Burden of Disease Research Unit, 2010:4).

Various studies agree that lifestyle intervention can improve the management of diabetes. Few studies, however, consider whether lifestyle intervention can improve the management of Type 1 diabetes within the South African context. The idea behind the study was to provide lifestyle intervention within a group setting, in order to gain the benefit of both lifestyle intervention and the therapeutic effects of groups.

The goal of the study was to determine the impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital. The problem statement and hypothesis that guided the study were as follows: i) Type 1 diabetic patients exposed to lifestyle intervention should experience a sustained increased motivation to adhere to a proper diet and exercise routine that continues even after the termination of the lifestyle intervention and ii) when exposed to lifestyle intervention, Type 1 diabetic patients will show a reduced HbA1c which will be sustained over a three-month period.

Quantitative applied research was conducted using a true experimental design. The population for the study was Type 1 diabetic patients aged between 18 and 40 who attended the Diabetic Clinic at Kalafong Hospital. The study used stratified random sampling to generate a sample.

Thirty-eight respondents diagnosed with Type 1 diabetes were selected for the study. Respondents underwent six lifestyle intervention sessions/groups. Blood tests were completed by respondents before the intervention and three months after termination of the intervention. A questionnaire was completed by the respondents before the intervention and three months after termination of the intervention. The questionnaires were analysed through the use of the following non-parametric tests: Wilcoxon Signed Rank Test, Mann-Whitney U Test and the McNemar Test. Significant findings were analysed further and discussed.

Significant findings included the questions pertaining to: management; time spent managing diabetes; perceived self-efficacy; goals and goal setting; feelings about diabetes and reported sources of support. The HbA1c blood results were analysed using SPSS (Statistical Package for the Social Sciences). The results were analysed using a univariate analysis and a T-test.

The conclusions of this study indicate that the lifestyle intervention, despite improving health literacy, had no significant effect on the motivation of Type 1 diabetic patients. Even from the biopsychosocial perspective, the intervention failed to significantly affect either the biological, psychological or social aspects of the respondents. The recommendations offered by the study can be used by social workers within healthcare, to guide future research and to assist in the planning for lifestyle intervention programmes within healthcare settings.

## List of key terms

Biopsychosocial

Diabetes

Impact

Intervention

Motivation

Lifestyle

Type 1

## Acronym List

BSW: Bachelors of Social Work

CBD: Central Business District

CEO: Chief Executive Officer

DES: Diabetes Empowerment Scale

DES-SF: Diabetes Empowerment Scale-Short Form

DKA: Diabetic Ketoacidosis

HbA1c: Glycated Haemoglobin

MDI: Multiple-Dose Insulin

MDT: Multi-Disciplinary Team

P-value: Probability Value

SEMDSA: Society for Endocrinology, Metabolism and Diabetes of South Africa

SPSS: Statistical Package for the Social Sciences

UP: University of Pretoria

WHO: World Health Organization

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# The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital

## Chapter 1: General introduction

### 1.1 Introduction

“Silent killers” – they are those conditions that are only found through laboratory tests (Tattersall, 2009:185). These conditions are appropriately labelled as they erode away health, only to be discovered once the damage has already been done. Diabetes is one such silent killer.

Diabetes is prevalent world-wide and the number of people who live with the disease continues to increase daily. Over 80% of people diagnosed with diabetes worldwide live in low- to middle-income countries such as South Africa (World Health Organization (WHO), 2012a; WHO, 2012b). South Africa has approximately 6.5 million people affected by diabetes (Liberty, 2010:1). This number continues to grow despite advances in medical technology and healthcare – indicating a need for an alternative approach to the treatment and management of diabetes (Ripich & Healthy, 2010:9; WHO, 2011:19). Lifestyle intervention appears to be a promising alternative to the current approach used in managing diabetes.

Lifestyle intervention facilitates healthy living through education regarding diet, disease and exercise through behaviour modification (Sarrafzadegan et al., 2009:39). Lifestyle intervention has been widely used to improve treatment outcomes for Type 2 diabetic patients. However, lifestyle intervention has seldom been used for improving treatment outcomes of Type 1 diabetic patients. It would appear that lifestyle intervention is seen as being mainly concerned with the prevention of diabetes. The value and use of lifestyle intervention is not limited to prevention of disease. Lifestyle intervention can also greatly assist in the management of

diabetes. Management, rather than prevention, is all the more important in the instance of Type 1 diabetic patients.

This study aimed at evaluating the effect of lifestyle intervention on the motivation of Type 1 diabetic patients within Kalafong Hospital. As discussed later in this chapter, motivation plays an important part in lifestyle intervention. Motivation importance is linked to its influence on the establishment of healthy habits.

## 1.2 Rationale and problem formulation

The rationale and problem formulation serves to clarify the reasoning behind the choice of study and research methodology. The importance and value of a study into the effect of lifestyle intervention in Type 1 diabetic patients is best explained with reference to an understanding of what Type 1 diabetes is, the context of Type 1 diabetes in South Africa, the effect of poverty on Type 1 diabetes, and how lifestyle and motivation affect the treatment of the condition.

Within this study the impact of the lifestyle intervention on the motivation of Type 1 diabetic patients within Kalafong Hospital was measured. The study formed part of a larger multi-disciplinary research project conducted by the Department of Internal Medicine, University of Pretoria. This project implemented a six-week lifestyle intervention programme. Following the lifestyle intervention, respondents were identified who would be trained to serve as community consultants/lifestyle coaches. The lifestyle intervention provides an opportunity to further the field of knowledge whilst enabling and empowering the respondents (Department of Internal Medicine, 2012:5).

Diabetes is a crucial concern and a condition that affects a large percentage of the world's population. Diabetes is best understood as the end result of a chain of events. The food we eat becomes glucose. The glucose fuels our bodies and insulin is the key that allows the fuel to be used by our bodies (Naheed, 2011:3). Insulin is a hormone produced by the pancreas (National Institute of Health, 2008:1). Diabetes occurs when the body either no longer makes insulin, or becomes unable to use the insulin produced (Keeler, 2004:1). In the instance of diabetic

patients, either the pancreas produces little or no insulin, or the cells do not use the insulin appropriately (National Institute of Health, 2008:1).

There are three types of diabetes, namely Type 1, Type 2 and gestational diabetes. This study focused only on Type 1 diabetes (Type 2 diabetes is discussed as a point of reference). Type 2 diabetes (also known as Non-Insulin-Dependent Diabetes Mellitus) results from insufficient insulin, caused by various factors, collectively known as insulin resistance (Holt & Kumar, 2012:1). Type 1 diabetes (also known as Insulin-Dependent Diabetes Mellitus), however, results from the complete destruction of the insulin-secreting cells within the pancreas (Holt & Kumar, 2012:1).

Although diabetes is the same worldwide, the treatment and access to treatment is not. This study took place within the South African context. South Africa is described as a developing country, pushing towards equality (SEMDSA, 2012:4; Smith, 2010). Within South Africa, an estimated 6.5% of adults aged between 20 and 79 live with diabetes while 61% of South Africans are severely overweight – 17% being children under the age of nine (SEMDSA, 2012:4; Smith, 2010). Lifestyle plays a major role in this.

Lifestyle is crucial in diabetes treatment. Lifestyle forms part of the pillars of diabetes treatment and prevention. These pillars are: diet, exercise, regular testing, pharmacological therapy and education (Naheed, 2011:75). The pillars of treatment emphasise “naturopathy” – the stimulation of the body’s innate healing ability, a holistic approach advocating lifestyle change (Ripich & Healthy, 2010:41).

The need for the inclusion of lifestyle intervention into the treatment plan of patients at Kalafong Hospital was identified through:

- i) ninety per cent of the patients presented with elevated blood sugar despite receiving standard treatment and education (Department of Internal Medicine, 2012:3). This meant that many patients were trapped within a cycle in which they continually managed their condition but never saw sustainable and positive change.



- ii) the finding that most patients were passive receivers of medical treatment, resulting in poor control, self-efficacy and treatment outcomes. This was an observation shared among the multidisciplinary team working with the patients. As will be discussed later, this was also due to many of the patients having poor health literacy.
- iii) the knowledge that in 2007 alone 20 139 South Africans died from diabetes (Burden of Disease Research Unit, 2010:4).

Lifestyle is a contributing factor both to the development of Type 2 diabetes and to the treatment of both Type 1 and Type 2 diabetes. Lifestyle is defined as “a set of attitudes, habits, or possessions” (Collins English Dictionary, 2009). Lifestyle is thus determined by habits, attitudes and various socio-cultural factors. Lifestyle can be better understood through an example. An example of an unhealthy lifestyle is one which is associated with obesity and inactivity. Lifestyle associated with obesity and inactivity has been shown to be the leading cause of preventable deaths (Linmans et al., 2011:1).

Various studies agree that lifestyle intervention has positive effects and all recommend that, where possible, lifestyle intervention should form part of the treatment plan for both Types 1 and 2 diabetics (American Diabetes Association, 2012:15-40). Numerous studies also find that lifestyle modification focusing on diet and activity reduces the chance of developing Type 2 diabetes by as much as 58% (Harris, Petrella & Leadbetter, 2003:1620). The same lifestyle modification also assists Type 1 diabetic patients. These positive effects for Type 1 diabetic patients are improved management of diabetes and reduced treatment costs for both the individual and the institution (The Diabetes Prevention Programme Research Group, 2012:723).

As discussed in chapter 2, group work is the ideal method for presenting lifestyle intervention. Educational groups allow for the positive effects of lifestyle modification, as discussed above, to be experienced by many individual patients at once. Employing group work lifestyle intervention further assists in decreasing treatment cost. It reduces treatment cost to the individual as a healthier lifestyle would result in fewer complications. It also reduces the cost to the institution as group work allows many individuals to be reached at the same time, thus

reducing manpower and cost of the intervention. Groups have been shown to be equally if not more effective at educating patients while also providing the benefits mentioned above (Rickheim et al., 2002:269).

The researcher consulted previous research regarding lifestyle intervention and its effect on the management of Type 1 diabetes. He found that a major shortcoming within previous studies citing the positive effects of lifestyle intervention on the management of diabetes was as follows: although lifestyle intervention projects and programmes had been studied abroad, especially in America and Canada, the results of these studies varied (The Diabetes Prevention Programme Research Group, 2012:723; The Diabetes Prevention Programme Research Group, 2002:393; Wing et al., 1998:350).

These studies offered a limited account of how the individual was affected by the study and none had considered the effect of such an intervention on Type 1 diabetics, or diabetics within a South African context. Furthermore, there was no literature to indicate whether the impact of lifestyle intervention on motivation within a South African context would be maintained after termination of the intervention.

This study aimed at evaluating the effect of this intervention on the motivation of Type 1 diabetic patients. This served an important purpose as previous research had reflected the positive impact of the intervention, based on the initial baseline measurements compared to measurements at the end of the study, without including a reflection on whether the impact was sustained. This study looked at how motivation was affected throughout the study itself, as well as motivation three months after termination of the intervention.

Motivation was integral to the sustainability of the positive effects that were attributed to lifestyle intervention programmes, seeing that motivation greatly influences our lifestyle habits. This led the researcher to the following problem statement: **Type 1 diabetic patients exposed to lifestyle intervention should experience a sustained increased motivation to adhere to a proper diet and exercise routine that continues, even after the termination of the lifestyle intervention.**

The researcher then proposed the following hypothesis: **When exposed to lifestyle intervention, Type 1 diabetic patients will show a reduced HbA1c which will be sustained over a three-month period.** The hypothesis was included to complement the problem statement as it built on the problem statement by providing a clearly measurable objective (De Vos, Strydom & Delpont, 2011:34-35; Creswell, 2013:134).

The researcher also had a personal interest in the management of diabetes for some time, based on members of his family undergoing treatment for diabetes. This research was thus motivated both by personal interest and educational research opportunity. The researcher had also been employed as a social worker in a medical setting, during which he had observed the need for diabetic patients to have access to more than just the normal medical management of the disease. Patients require intervention that will motivate them to change their lifestyle and achieve sustainable results.

### 1.3 Theoretical framework

The researcher was led to choose the biopsychosocial perspective as the theoretical framework for this study, based on its compatibility with the study. The biopsychosocial perspective allowed the researcher the opportunity to assess both biological and psychological measures and comment on the relationship and effect that these had on one another. The model is discussed in further detail in chapter 2.

### 1.4 Goal and objectives

The goal of the study was to determine: **The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital.** This goal reflected the intent of evaluating the programme and provided a clear focus for the study.

The objectives of this study were:

- to conceptualise diabetes as a phenomenon and its impact on patients,

- to do a baseline and post-intervention measurement of both the motivation and average blood glucose (HbA1c) of diabetic patients at the start of the lifestyle intervention with both the experimental and the control group. The experimental group will undergo the lifestyle intervention programme whilst the control group will receive only standard medical care,
- to describe the contents of the lifestyle intervention programme,
- to implement six group-education sessions to educate Type 1 patients on diabetes mellitus,
- to determine the impact, if any, of the lifestyle intervention on the motivation of diabetic patients within Kalafong Hospital,
- to compare and describe the impact of the lifestyle intervention on the motivation of Type 1 diabetic patients within Kalafong Hospital against a control group, as well as against the results of the same intervention held with Type 2 diabetic patients,
- to recommend improvements to this programme.

The ultimate intention of the programme was to change behaviour and habits so that each patient could have increased quality of life. Quality of life can be improved by fostering a healthy lifestyle. A healthy lifestyle is a lifestyle which significantly lowers the risk of serious illness and early death (WHO, 1999:1). A healthy lifestyle thus allows an individual to live a quality life for as long as possible.

Behaviour, however, is only sustainable in as much as it becomes ingrained within the individual in the form of habits. Habit change involves identifying what you want to change and why, identifying what is keeping you from changing the habit, how you will change the habit (plan to reach your goal), implementing the change, monitoring the results and, finally, rewarding your success or modifying your plan if the implementation has failed (American Diabetes Association, 2003; Coffey, 2010:3).

## 1.5 Research methodology

The researcher used summative evaluation research through employing an impact or outcome evaluation, utilising a true experimental design. The research was quantitative and was performed using both a blood test (HbA1c) and a modified diabetes empowerment scale (the scale was combined with questions which would indicate an internal/external locus of control). Both of these data collection tools assisted in assessing the motivation of respondents. Data collection was done pre- and post-intervention (utilising a group-administered questionnaire for the pre-test and an individually administered questionnaire for the post-test), with the second blood test being done three months after termination.

Respondents were randomly assigned to either the control or experimental group, using probability-stratified-random sampling. The study sample consisted of 38 respondents between the ages of 18 and 40.

The detail of the research methodology and ethical considerations are discussed in chapter 3.

## 1.6 Limitations of the study

The study faced various challenges including:

- There was a long process towards ethical clearance by both Faculties of Humanities and Health Sciences.
- Working within a multi-disciplinary team (MDT) resulted in the intervention having to be held on days when the MDT was available. It also meant that the respondents had to complete not only the questionnaires and blood tests for this research, but for the research of the other MDT members as well.
- There were funding shortfalls.
- Attrition of staff involved with the research project occurred. Initially the team had a research coordinator and a physiotherapist. The physiotherapist found other

employment and the research coordinator passed away. Both of these members' inputs could still be implemented throughout the research but their direct contributions were no longer possible.

- Of direct relevance to the study was the finding that the standardised questionnaire was unsuitable. This impacted negatively on the validity and reliability of the study. To overcome this problem, a pilot test was conducted using a modified scale and questionnaire which worked better and was more relevant to the circumstances within Kalafong Hospital. The modified questionnaire was much easier for respondents to understand and allowed for them to easily answer the questions with yes/no responses, simple choices and open-ended questions. (Respondents could not complete a Likert-scale as used in the original scale.)
- The study was further limited in that the sampling population was only 287 individuals, from which 38 were chosen to be included in the study. Findings of the study can thus not be generalised outside of Kalafong Hospital. The study also utilised a non-standardised questionnaire, due to the limited literacy of the respondents which affected the validity of the findings.
- The study had a predominantly black population (37 out of the 38 respondents) which resulted in findings being biased as results came almost exclusively from one segment of society.
- The study did not have an equal representation of all the age groups and the researcher could thus not generalise findings to the various age groups.

## 1.7 Contents of research report

The research report is set out as follows:

- Chapter 1: General introduction: Introduction, rationale and problem formulation, theoretical framework, goals and objectives, research methodology and limitations of the study.

- Chapter 2: Diabetes, Lifestyle and Motivation: Introduction, key medical terms and other key terms, theoretical framework, diabetes mellitus, treatment and management of diabetes in South Africa, lifestyle intervention, motivation and its impact on lifestyle, educational group work as a means to facilitate lifestyle change, the role of the hospital social worker in lifestyle intervention and conceptualisation of chapter 2.
- Chapter 3: Research methodology and empirical findings: Research approach, type of research, research design, implementation of the randomised pre-test post-test control group design, population, sampling, data collection method, feasibility and findings.
- Chapter 4: Conclusions, recommendations and summary.

The next chapter will focus on the literature study.

## Chapter 2: Diabetes, lifestyle and motivation

### 2.1 Introduction

This chapter contains a theoretical framework and literature review for this study. The theoretical framework then helps the reader to gain an understanding of respondents from a biopsychosocial perspective and is then followed by the literature review.

This literature review provides context to the study by guiding the reader through a brief history of diabetes, its treatment and the impact it has on the individual, the family and society. As the study aimed to utilise lifestyle modification to impact motivation, the literature pertaining to lifestyle and motivation is analysed. Similarly, lifestyle and motivation group work is discussed.

Before delving into the content, some key terms are defined in order to aid the reader's understanding.

### 2.2 Key medical terms

#### *2.2.1 Diabetes mellitus*

Diabetes mellitus is a carbohydrate metabolism disorder in which abnormally large amounts of urine containing large amounts of sugar are passed (Collins English Dictionary, 2009; Taber's Cyclopedic Medical Dictionary, 2013:667). Within the study, this refers to a person suffering from a diagnosed carbohydrate metabolism disorder. More specifically, it refers to individuals where the pancreas is incapable of producing sufficient insulin.

Diabetes mellitus, as well as the various types thereof, are described in detail in this chapter.

#### *2.2.2 HbA1c*

HbA1c is a measurement of glycosylated haemoglobin levels (Taber's Cyclopedic Medical Dictionary, 2013:671). A high HbA1c level is an indicator of poor long-term glucose control



(Taber's Cyclopedic Medical Dictionary, 2013:671). This means that a high HbA1c level shows that the individual has not been able to manage their diabetes. This does not show if the high HbA1c level is due to poor compliance to medication, diet, illness, etc.

### ***2.2.3 Pathogenesis***

Pathogenesis is the "*origin or development of a disease*" (Taber's Cyclopedic Medical Dictionary, 2013:1752). Pathogenesis is the mechanism of the disease. It refers to the parts/processes in the body that are affected. An example in diabetes would be insufficient insulin production.

### ***2.2.4 Aetiology***

Aetiology, also referred to as etiology, is the cause of a disease. Aetiology is "*the study of the causes of disease*" (Taber's Cyclopedic Medical Dictionary, 2013:856). An example in Type 2 diabetes would be obesity.

## **2.3 Other key terms**

### ***2.3.1 Lifestyle***

This refers to "*Attitudes, habits, or possessions associated with a particular person or group*" (Collins English Dictionary, 2009). Within this study, lifestyle refers to a person's attitudes and habits regarding diet and exercise. Lifestyle includes the daily activities and actions. These actions and activities determine the long-term health outcomes of an individual.

### ***2.3.2 Self-efficacy***

Efficacy is seen as reaching the intended result (Collins English Dictionary, 2009). Self-efficacy, as used in this study, refers to a person's ability to care for their own diabetes and reach the result of controlled blood glucose. This in essence means that the researcher looks at self-efficacy in terms of an individual's behaviour and actions taken to assist towards or maintain control of their diabetes.

### 2.3.3 Motivation

Motivation refers to desire, interest and drive (Collins English Dictionary, 2009). Within this study, motivation is seen as the driving force that determines whether or not action will be taken. Motivation is thus assessed by looking at the variables that increase the likelihood of an individual engaging in the expected activity – here being education, exercise, diet and building of social support.

## 2.4 Theoretical framework – The biopsychosocial perspective

The researcher chose the biopsychosocial perspective as a theoretical framework. This model was chosen as it is holistic and patient centred.

The researcher wanted to evaluate what effect lifestyle intervention would have on Type 1 diabetic patients. Because the effect of a lifestyle intervention is measured through both biological and psychological outcomes, the biopsychosocial model stood out.

The origin of the biopsychosocial perspective is inseparable from the work of the American psychiatrist George Engel (1913-1999). From 1946, George Engel's work emphasised the importance of the mind-body connection (Shorter, 2005:3-4). Engel's work resonated with those physicians who felt that considering biology alone was insufficient, as medicine aims at treating people, not diseases. Engel's belief that the mind and body are interrelated changed the patient-doctor relationship, emphasising a shift away from the biomedical perspective where a patient was assessed according to symptoms, towards a holistic approach where biological, social and psychological factors are considered (Shorter, 2005:2-3).

The model focuses on the biological, psychological and social dimensions of health and illness (George, 2008:2). The perspective serves as both a guide and a philosophical approach. The model guides understanding of a patient's subjective experiences of their condition (Borrell-Carió, Suchman & Epstein, 2004:576). As a philosophy, the perspective serves to illustrate how the biopsychosocial dimensions impact on well-being (Borrell-Carió, Suchman & Epstein,

2004:576). This inclusion of psychosocial factors within research is imperative as these factors affect patient care and their inclusion allows for a holistic view of the patient (Mai, 1995:1-2).

The holistic view provided by the biopsychosocial perspective does cause deviation from the purely empirically-based approach that is characteristic of the biomedical model, by adding the psychosocial factors, thereby contributing to a clearer understating of the impact these relationships have on health and illness (Ghaemi, 2011:3-4).

Within this study it meant that the researcher considered not only the blood results or the questionnaires, but rather viewed the respondents holistically. Through utilising the biopsychosocial perspective, the researcher was able to look at patient motivation, while taking into account the biological, physical and psychological factors that were affected by the lifestyle intervention.

## 2.5 Diabetes mellitus

Over time, various types of the disease were distinguished from each other. Each of the types has its own pathogenesis, aetiology, clinical features and prognosis. All of the above are discussed below to clarify to the reader the character of the disease.

### *2.5.1 Brief history of diabetes*

Diabetes mellitus is a disease with a long history. Symptoms of diabetes have been recorded as far back as 400 BC; the term 'diabetes' was first used around 230 BC by Apollonius of Memphis (Jacek et al., 2010:3; DiabetesWellBeing, 2012; Naheed, 2011:5). The prognosis for anyone diagnosed was very poor as there was no known treatment for the condition.

During the early second century, diabetes was recognised; however, the disease was very rare, with physicians such as Galen only encountering it twice throughout his career (Jacek et al., 2010:3). Some argue that this low incidence was due to inadequate screening procedures.

It was only in 1776 that Matthew Dobson found that the sweet taste of diabetic urine was due to sugar in the urine; in 1788 Thomas Cawley suggested the link between diabetes and the

pancreas (Jacek et al., 2010:4). Knowing that the urine of diabetic patients is high in glucose, Eugene Chevreul, in 1848, developed a urine glucose test which would be widely used in the diagnoses of diabetes (Jacek et al., 2010:4).

A flurry of research followed from all over the world, looking at everything from causes to complications until, in 1921, Frederick Banting and Charles Best achieved the first successful clinical use of pancreatic extract (insulin) on a 14-year-old patient (Jacek et al., 2010:6; Tattersall, 2009:57). The use of insulin was a major turning-point in the history of diabetes care. Insulin could now be provided to manage a condition where patients previously had a poor prognosis without any consistently effective treatment.

In 1921 diabetes was described as an epidemic for the first time, with many more people being diagnosed within specific regions than expected by medical practitioners of that time (Tattersall, 2009:178-179;). Research has continued, relentlessly, to improve the treatment options available and provide alternative forms of treatment.

### *2.5.2 Types of diabetes*

There are various types of diabetes. The various types are Type 1, Type 2 and gestational. Type 1 and Type 2 are considered to be the main types. For the purposes of this study, only Type 1 and Type 2 diabetes will be discussed.

#### **2.5.2.1 Type 1 diabetes**

Type 1 diabetes is caused by the autoimmune destruction of  $\beta$ -cells of the pancreatic islets (Holt & Hanley, 2012:236). Type 1 diabetes is rare, affecting only about 5-10% of diabetic patients; it often presents together with severe complications in children and young adults (Holt & Hanley, 2012:258). Type 1 patients have absolute insulin deficiency. This means that while a Type 2 diabetic can cope with oral medication and strict dietary constraints, a Type 1 diabetic cannot.

Most Type 1 diabetic patients are diagnosed at a young age (up to a young adult) (Holt & Hanley, 2012:259). The incidence of Type 1 diabetes is highest at age 11 for girls and 14 for boys (Holt & Hanley, 2012:259).

The mechanisms that cause Type 1 diabetes are not yet well understood. The current prevailing theory is that an environmental factor causes selective autoimmune destruction of the  $\beta$ -cells in the pancreas (Holt & Hanley, 2012:259). This theory is supported by the finding that a high number of these selective antibodies are found in patients shortly before or after the destruction of the  $\beta$ -cells and the consequent diagnoses of Type 1 diabetes (Holt & Hanley, 2012:260).

Interestingly, these antibodies have been quite accurate (98%) in predicting whether an individual will develop Type 1 diabetes months before he/she does. Sadly, this does not yet assist in preventing the onset thereof (Holt & Hanley, 2012:260).

It is considered that both genetic and environmental factors play a role in the development of Type 1 diabetes. So far only the genetic factors have been confirmed. Environmental triggers are currently still unknown.

Most patients have a short illness (up to 4 weeks) (Holt & Hanley, 2012:263). Patients often also have the so-called “classical triad of thirst”. The classical triad of thirst includes: polydipsia (excessive thirst), polyuria (excessive urination) and weight-loss. Other symptoms could include: blurred vision, drowsiness, dehydration, urinary tract infection, fatigue, wasting, weight-loss and diabetic ketoacidosis (DKA) (Holt & Hanley, 2012:263).

Before the development of insulin treatment in 1921, diabetes was a death sentence. Most people diagnosed would die shortly after diagnosis due to diabetic ketoacidosis (DKA) (Holt & Hanley, 2012:263). DKA is the cause of many early deaths. Death at later ages is mostly associated with cardiovascular disease and neuropathy. For those living with Type 1 diabetes, the mortality rate is 8-40% higher than the general population (Holt & Hanley, 2012:264).

### 2.5.2.2 Type 2 diabetes

Type 2 diabetes results from insufficient insulin being secreted and from insulin resistance (Holt & Hanley, 2012:286). Type 2 diabetes makes up about 90% of all the diabetes worldwide. The prevalence of Type 2 diabetes is rapidly increasing (Holt & Hanley, 2012:286). WHO predicts that by 2030 the number of people living with diabetes will have doubled (Holt & Hanley, 2012:286). This means that about 1 in 10 people will live with diabetes by 2030.

Risk factors for Type 2 diabetes are: i) environmental and ii) un-modifiable. Environmental factors, which pose the bigger risk to people developing diabetes, include (Holt & Hanley, 2012:288):

- Obesity
- Inactivity
- Poor diet
- Urbanisation
- Sleep apnoea

The un-modifiable factors are (Holt & Hanley, 2012:288):

- Genetics
- Birth weight
- Ethnicity
- Age
- Past history with diabetes

The risks for developing Type 2 diabetes are much higher for people who have a relative with Type 2 diabetes. The highest risks are a) when both parents have diabetes (75% chance of developing diabetes) or b) if one's monozygotic twin has diabetes (90% chance of developing diabetes) (Holt & Hanley, 2012:288).

Type 2 diabetic patients generally have a shorter lifespan (premature mortality), cardiovascular complications and a two- to three-fold higher risk of myocardial infarction or stroke (Holt & Hanley, 2012:292).

Typical features are: polyuria, nocturia, thirst, tiredness and blurred vision. Unfortunately, Type 2 diabetes has a gradual onset. A third of these people are diagnosed by accident following a cardiovascular complication (Holt & Hanley, 2012:292). Diagnosis is often delayed by up to 20 years. This is due to the gradual onset of the disease. This indicates both a need to improve screening and to improve society's health literacy by educating people so they are able to identify these features themselves.

Both types of diabetes share certain features or symptoms. There are, however, some interesting differences. Unlike Type 2 patients, Type 1 diabetic patients are typically slim, have no family history of diabetes and they are affected at any age, whereas Type 2 usually presents at a later age (Holt & Hanley, 2012:265).

### *2.5.3 Complications of diabetes (for both Type 1 and Type 2)*

Complications associated with diabetes mellitus can be grouped under either microvascular or macrovascular complications.

#### **2.5.3.1 Microvascular complications**

Microvascular complications affect over 80% of diabetic patients (Holt & Hanley, 2012:312). These complications are due to prolonged hyperglycemia (high blood glucose). Prolonged hyperglycemia results in:

- **Retinopathy**

Retinopathy refers to retinal damage/disease that causes gradual loss of vision or complete blindness (Taber's Cyclopedic Medical Dictionary, 2013:2038). Retinopathy develops without clinical features until there is a catastrophic haemorrhage that could cause blindness (Holt & Hanley, 2012:318).

An annual eye test (through use of retinal photography) is given to each diabetic patient at Kalafong Hospital to screen for damage. This, together with good glycemic control, can prevent or delay the onset of retinopathy.

- **Nephropathy**

Nephropathy refers to disease of the kidney (Taber's Cyclopedic Medical Dictionary, 2013:1591). Nephropathy is more common in Type 1 patients than Type 2 patients. Nephropathy is the most common cause of established renal failure, affecting 30-40% of all diabetic patients (Holt & Hanley, 2012:321).

Kalafong Hospital screens patients' urine annually. Screening allows doctors to see if there are signs of nephropathy. Early intervention in cases where there are signs of nephropathy slows the progression of the disease and protects against further complications.

- **Neuropathy**

This refers to disease of the nerves (Taber's Cyclopedic Medical Dictionary, 2013:1613). Patients would often complain of a burning feeling, pain and discomfort in their feet and hands. The neuropathy can range from causing discomfort all the way to completely debilitating the patient due to pain.

- **Erectile dysfunction**

Erectile dysfunction refers to the inability to achieve/sustain an erection for sexual intercourse (Taber's Cyclopedic Medical Dictionary, 2013:744). Erectile dysfunction affects not only the patient but his partner as well. Erectile dysfunction is a serious complication that impacts directly on quality of life. Erectile dysfunction is also often left untreated due to patients failing to report it. Patients often feel shy or embarrassed and "suffer in silence".

Female diabetics can also have complications regarding their sexual health. Female sexual health complications include vaginal dryness, impaired sexual arousal and urinary infections (Holt & Hanley, 2012:330).



- **Foot problems**

Foot problems, despite sounding like a minor complication, are a major cause of death in diabetic patients (Holt & Hanley, 2012:325). Foot problems are caused by poor circulation. The poor circulation causes any foot injury to potentially deteriorate into a serious foot problem. One-quarter of diabetic patients (25%) are affected and foot problems are the most common and most expensive reason diabetic patients are admitted to hospital (Holt & Hanley, 2012:325). Diabetic foot problems can easily lead to amputation and are preventable.

Diabetic foot problems so easily result in amputation and often start as a simple foot ulcer. Foot ulcers are common due to a combination of both neuropathy and ischaemia (Holt & Hanley, 2012:326). The ulcer itself is not a major concern but, due to diabetic patients' reduced circulation, the body is not able to effectively heal the injury or infection (Holt & Hanley, 2012:326).

The main methods of preventing foot problems in diabetic patients are: i) proper self-care (e.g. ensuring feet are clean and dry), ii) bed rest (to ensure the foot is not placed under pressure while it heals from any injury/infection), iii) use of shoes that won't injure the foot, iv) use of antibiotics if there is any infection and v) hospitalization in severe cases (Holt & Hanley, 2012:328).

To prevent foot problems from becoming life-threatening issues, Kalafong Hospital screens all diabetic patients for any possible problems on an annual basis. If a problem is identified, the patient will be referred or admitted in order to ensure a speedy recovery.

### **2.5.3.2 Macrovascular complications**

Macrovascular complications include a number of complications involving the large blood vessels. These complications result in cardiovascular disease, myocardial infarction, stroke and peripheral arterial disease. Type 1 diabetic patients are at a four to eight times higher risk of developing macrovascular complications (Holt & Hanley, 2012:331).

It must be noted that despite sharing similar treatment and complications, Type 1 diabetes is unique and requires unique management. As mentioned earlier, Type 1 patients have no insulin production capability and thus require insulin from the onset. The management of Kalafong Hospital relies heavily on the patients' lifestyle. The patient needs to balance the amount of insulin they take with their diet and activities.

#### *2.5.4 Link between lifestyle and complications for Type 1 diabetic patients*

Various studies state that lifestyle can assist Type 1 diabetic patients in reducing their risk of developing complications. Although the relationship between lifestyle and complications is not as clear in the case of Type 1 diabetes as it is in the case of Type 2 diabetes, there is no doubt that a healthy lifestyle does protect against many of the complications common to diabetic patients (Soedamah-Muthu, Abbring & Toeller, 2011:22).

#### *2.5.5 Screening and diagnosis of diabetes*

In modern society physicians no longer have to doubt whether a person does or does not have diabetes. Various blood tests can confirm or deny any suspicion. The tests used to diagnose Type 2 diabetes are: A1C, fasting plasma glucose (FPG) and 2-h plasma glucose (2-h PG) (American Diabetes Association, 2015:S8). These tests allow a physician to diagnose a patient with diabetes. The tests also assist in the diagnoses of patients by excluding other conditions.

Unlike Type 2 diabetic patients, Type 1 diabetic patients are usually only diagnosed when showing acute symptoms or even diabetic ketoacidosis (excessive levels of ketones within the blood due to the body trying to burn fat for sugar) (American Diabetes Association, 2015:S11). The reason is that Type 1 patients often do not display any of the risk factors or symptoms commonly associated with the development of diabetes. These are: obesity, frequent urination, constant thirst and other metabolic risks.

Five to ten per cent of all diabetic patients are diagnosed as Type 1 diabetics. Most Type 1 patients are under 18 years old (Naheed, 2011:3; Diabetes UK 2007:19). Type 1 diabetes is 50 to 60 times more common in patients under the age of 18 (Naheed, 2011:3; Diabetes UK 2007:19).

Testing for Type 1 diabetes is done when a person presents with weight loss and any one of the other classical triad of thirst mentioned above. Islet auto-antibodies are a further indicator of Type 1 diabetes, but are not conclusive if considered alone (Holt & Hanley, 2012:264).

To diagnose Type 1 diabetes, only one glucose reading above the cutoff (the cutoff is a fasting glucose of seven? or higher) is required for the patient to be diagnosed as a Type 1 diabetic as the person already has other symptoms (Holt & Hanley, 2012:264). If, however, the person does not have any clear clinical features associated with Type 1 diabetes, then it is difficult to distinguish whether the person is Type 1 or Type 2 (Holt & Hanley, 2012:264).

Research shows that a preventative lifestyle both improves health in the long term and assists both Type 1 and 2 diabetic patients with the management of their condition (The diabetes epidemic and its impact on Europe, 2012:11).

A preventative lifestyle is a lifestyle that, through diet, exercise and management of the disease, assists in preventing the development of the complications discussed above. Thus, an individual who practises healthy diet, regular exercise and adheres to treatment is someone who exercises a preventative lifestyle.

### *2.5.6 Effect of diabetes on the individual and those around him/her*

Diabetes has a large impact, not only on the individual living with the condition, but also on those around him/her. Certain impacts of diabetes such as a complication are reasonably well known but, as mentioned before, diabetes does not end at the individual; it also affects the family and society. Understanding this impact is crucial to any intervention.

Without understanding the context of the diabetic patient, intervention will not be as effective as is possible. Only in considering the diabetic as someone who is influenced by and influences his/her family, friends and society, can interventions be targeted. These interventions can be implemented as diabetics consider the above and incorporate them into the intervention.

### **2.5.6.1 Impact on the individual**

Literature shows that the impact of diabetes for the patient is essentially three-fold. Firstly, the individual faces biological challenges. Secondly, the condition strains the individual's mental well-being. Thirdly, it also affects how the individual is viewed by society. These are each considered in more detail below.

- **The biological effect on the patient**

The most clearly manifest impacts of diabetes are the various complications of diabetes as set out above. All of the complications have a major impact on the individual's life, as well as his/her quality of life. This is due to the various important roles insulin plays within the body.

Insulin fulfills roles within the body from the building of molecules, the storing of glucose and the transportation of glucose to the preservation of glucose, protein and fat (Naheed, 2011:8). Thus, an impaired production of insulin results in a compromised ability to utilise, store, transport and preserve much of the nutrition obtained from the diet. Diabetes places the individual at risk of complications, as discussed above (The diabetes epidemic and its impact on Europe, 2012:37).

- **The mental effect on the patient**

From a mental health perspective, research shows that people living with diabetes are at twice the risk of depression (Young & Unachukwu, 2012:5). This is due to the stress associated with chronic disease and feeling different from so-called "normal" people. Diabetes patients also suffer from the fear of developing diabetes-related complications.

These stressors are diminished if the individual has strong interpersonal relationships (Young & Unachukwu, 2012:5).

- **The social impact of diabetes**

The social impacts of diabetes are numerous. Some of the impacts that have a direct negative effect on the diabetic patient are isolation, stigmatisation, exclusion and disregard of the individual's ability and autonomy.

Diabetics experience quality of life when they are healthy, supported by family, feel accepted and feel they can manage their treatment (Young & Unachukwu, 2012:6). It is, however, easy for diabetics to become isolated due to others not understanding the condition, or due to the individual feeling inadequate because of his/her diabetes.

Diabetes also affects the type of activities an individual can engage in. Diabetics are unable to engage in drinking and smoking without great risk to their own well-being. Diabetics also have to monitor food intake, exercise and blood glucose levels continually to be able to use the correct amount of insulin. This responsibility makes it difficult for diabetic patients to be spontaneous. This places strain on social relationships as diabetes management and expectations from others can often come into conflict.

#### **2.5.6.2 Effect on the family**

This study focused on Type 1 diabetic patients over the age of 18. It was helpful to consider the effect that diabetes had on the individual under the age of 18 in order to better understand his/her context. The psychological experience of children with diabetes and parents of children with diabetes highlights the extent to which diabetes affects not only the individual but the entire system the patient finds him/herself in.

The impact that diabetes has on the family unit is often just as severe as the impact on the individual. The family has to adapt, change and assist the one diagnosed. Many parents feel they have lost a healthy child, flexibility, freedom and spontaneity (Snoek, Frank & Skinner, 2000:3; Young & Unachukwu, 2012:6). The challenge for parents is huge. The stresses surrounding societal norms of being good parents often cause the parents to experience even

more distress. The parents feel that they have to raise a “normal” child in the eyes of society; this while they feel they have to manage treatment as well.

When an infant or child is diagnosed, the daily survival of the child is dependent on the decisions the parents make. The responsibility of healthcare is moved from healthcare practitioner to the family (Snoek, Frank & Skinner, 2000:1). The family has to become a restricting presence in the world of the child. The parents have to impose strict regulation on food intake, physical activity and insulin injections (Snoek, Frank & Skinner, 2000:1; Young & Unachukwu, 2012:6).

These restrictions affect the relationship between parent and child. Children usually spend the first two years of life establishing emotional attachment with the primary care giver (Snoek, Frank & Skinner, 2000:2). This becomes strained as day-to-day management of the diabetes often results in parents becoming fearful and exhausted. Many parents become unwilling to trust others with the care of the child, causing them to limit the opportunities the child has to explore and grow (Snoek, Frank & Skinner, 2000:3). Children have an innate need to explore and master their environment. This is part of their natural development. Their autonomy is threatened by the overprotection of the parents.

The family is also affected if either parent is a diabetic. Children need stable care givers who can provide certainty, security and support (Alva, 2002:54). A diabetic parent or care giver could result in strain on the family. The children might be fearful of hypoglycaemic episodes. The other family members might also feel that the diabetic parent or care giver is ill-suited to providing proper care to the child or children.

### **2.5.6.3 Effect on society**

The impact of diabetes does not end with the individual and the family. Society is affected by the diabetic epidemic in numerous ways. Diabetics make up part of the population – they too form part of society. They work, play, eat and interact with others daily. They also require lifelong care which comes at a cost, not only to the individual and family as discussed above,

but to society as well, through taxes. Those with diabetes require at least two to three times the healthcare resources of people who do not have diabetes (WHO, 2003:2).

Within society there are also many who misunderstand or are unaware of what diabetes entails. Due to this, the diabetic patient can easily be marginalised due to their condition. This has real life impacts on the individual as some employers, for example, would not hire someone they know is diabetic (Young & Unachukwu, 2012:5).

A diabetic is part of society but is often ostracised by society and viewed as different or not complete. Based on the discussion above, it is clear that diabetes is multidimensional. Diabetes affects all levels from the individual and family to society.

Diabetes has a major cost to society. This is concerning as society often neglects the risks and promotes a culture which encourages an unhealthy lifestyle and which places people at risk of developing diabetes. Because of this, there is a great need for lifestyle interventions to be researched as a means to improve motivation and assist in the management of diabetes.

## 2.6 Treatment and management of diabetes in South Africa

As should be clear by this point, Type 1 diabetes requires unique interventions. Diabetes treatment and management require both pharmacological treatment and lifestyle change for maximum positive effect. The lifestyle of the individual is largely influenced by context. Context largely determines which options the individual has open. Context can also limit choices in diet, activities and treatment.

### *2.6.1 Context of Diabetes Mellitus in South Africa*

Let us now consider the context of the Type 1 patients at Kalafong Hospital and how it is that they manage their diabetes treatment.

- **South African population**

Within South Africa there are eleven official languages. This is testament to the diversity of the South African population. The South African population is at an estimated 48 601 098 people as of July 2013 (KPMG, 2015). South Africa is a developing country and the majority of the population (65.6%) is between the ages of 15 and 64 years (KPMG, 2015). The average life expectancy for a South African is 50.43 years for a male and 48.51 years for a female (KPMG, 2015).

- **South African education**

South Africa offers a three-tier system of education spanning primary, secondary and tertiary education (KPMG, 2015). The majority of the population only completes primary education with a large drop-out in graduation rates for both secondary and tertiary education.

Despite access to education, South Africa remains scarred with an evident culture of violence that is said to be carried over from the apartheid era (Centre for the Study of Violence, 2009:4). Restraints on the transformation and development of South Africa into a truly democratic and united country include an unsustainable social security system, widespread inequality and acute poverty (Triegaard, 2006:1). All of these factors directly affect not only the access to education but also to the value that is placed on education within society.

- **South African economy**

The South African economy is described as a middle-income emerging market with a lot of natural resources (KPMG, 2015). The country as a whole is still working towards overcoming the damages done by apartheid. Current challenges include poverty, inequality and a lack of economic empowerment (KPMG, 2015).

Social security is seen as a failsafe and first line defence against extreme poverty. With so many relying on grants from government and almost no evidence to support the view that grants alleviate poverty, the sustainability of South Africa's social security system has been brought



into question (Woolard, Harttgen & Klasen, 2000:46-47). The most significant impact this has is the complete reliance on government healthcare.

Poverty greatly affects the treatment of Type 1 diabetes. This is because patients find it difficult to afford a balanced diet. Most patients report that they can only afford starches.

Gannett (2012:14) describes the link between poverty and diabetes as follows: low socio-economic conditions become barriers to healthy lifestyle and interfere with treatment. Diabetes UK (2006:15) and Gannett (2012:14) agree that inequality and poverty not only increase the risk of diabetes (through factors such as poor health, physical activity, food insecurity and poor health literacy), but complicate the treatment thereof.

South Africa's population of about 50 million has about 80% of the population utilising government basic healthcare (KPMG, 2015). This large number puts severe strain on the budget available for health (8.8% of the total budget 2015 [National Treasury, 2015]). Government healthcare is funded primarily by the national treasury with an aim towards implementation of a National Health Insurance scheme (KPMG, 2015). This, coupled with the culture of violence, inequality and poverty, sees many of South Africa's citizens utilise government services in order to survive.

### *2.6.2 Context of South African healthcare*

The South African healthcare system is far more burdened than developed countries (Steyn, 2006:1). Because of this burden, prevention, early intervention and cost-effective management of chronic diseases receive the least attention of all the activities related to health (Steyn, 2006:1).

The ideal would be a system emphasising prevention of risk factor development – also referred to as primordial prevention. This type of prevention targets all of society and utilises any means of marketing that is available. The benefit thereof is increased health literacy and easy identification of those who are at risk before any complications arise (Steyn, 2006:4-5). An

added benefit of a preventative approach is that future cost will be saved and complications avoided, thereby improving quality of life.

Treating acute illness in isolation (only treating patients retrospectively) severely limits the effectiveness of the treatment. The effectiveness is short-term based and leads to a much higher cost to the healthcare system in the future. Ideally an individual would receive holistic treatment. Ideally he/she would be provided with both medical treatment and lifestyle intervention.

Unfortunately, as mentioned above, there is still a lot of work to be done before the South African healthcare system becomes more preventative and less reactive. Currently, prevention is only done where possible, with the majority of the healthcare budget and healthcare focus being placed on reacting to complications etc.

### *2.6.3 Context of Kalafong Hospital*

Kalafong Hospital, a public/state health facility, located 12km west of Pretoria's central business district (CBD) or city centre, near Atteridgeville, opened its doors to the public on the 1<sup>st</sup> of March in 1972 (University of Pretoria, 2011).

Kalafong serves as a training centre in collaboration with the University of Pretoria, where students from various disciplines related to healthcare or supplementary healthcare receive practical training (University of Pretoria, 2011). Hosting 1 113 beds, Kalafong has constant bed occupancy of around 80-85% (University of Pretoria, 2011).

Kalafong possesses a variety of facilities and a multitude of professional staff. It is able to cater for all ages; however, the majority of the patients being treated are aged between 13 and 59 (Tsakani, 2011; Bauwh, 2011; Kekana, 2011).

### *2.6.4 Treatment of Type 1 diabetics at Kalafong Hospital*

Society has come a long way since the initial treatments which involved diet, various herbs, bloodletting (the practice of cutting and letting blood drain as a form of treatment), starvation

and even opium (Savona-Mentura, 2002:5; Naheed, 2011:5). These were the main forms of treatment until the discovery of insulin in 1921 (Tattersall, 2009:57). The current treatment of Type 1 diabetes is as follows.

In the diabetes clinic at Kalafong Hospital, patients are treated according to the guidelines of the Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) (2012). This sees patients receiving the required insulin replacement therapy (dependent on individual factors), regular screening for complications as discussed previously, as well as patients having their HbA1c tested regularly. Patients are also provided with referrals to dieticians for education and advice on making lifestyle changes to better manage their diabetes.

Ninety-five per cent of diabetes management is self-care and most Type 1 diabetic patients require multiple-dose insulin (MDI) injections, consisting of three to four injections daily (American Diabetes Association, 2015:S41; Diabetes UK, 2007:12). These injections have to be matched to diet (carbohydrate intake).

## 2.7 Lifestyle intervention

Lifestyle intervention refers to the modification of behaviour in which both diet and exercise is targeted (Sarrafzadegan et al., 2009:39). Throughout the lifestyle intervention treatment, diet, exercise as well as other topics are covered during six group work sessions. The content of the intervention is discussed in more detail in chapter 3.

### *2.7.1 Lifestyle's impact on diabetes management*

Lifestyle intervention assists in both the prevention of Type 2 diabetes and management of both Type 1 and Type 2 diabetes, while also reducing treatment costs for both types (The Diabetes Prevention Programme Research Group, 2012:723).

The importance of lifestyle as a component of diabetes treatment is illustrated in the pillars of diabetes treatment. The pillars of diabetes treatment are: diet, exercise, regular testing, pharmacological therapy and education (Naheed, 2011:75). It becomes clear, considering the

pillars of treatment, that diabetes treatment emphasises “naturopathy” – the stimulation of the body’s innate healing ability, a holistic approach advocating lifestyle change (Ripich & Healthy, 2010:41).

Numerous studies agree that lifestyle modification focusing on diet and exercise assists in the management of Type 1 diabetes and can reduce the chance of developing Type 2 diabetes by as much as 58% (Harris, Petrella & Leadbetter, 2003:1620).

### *2.7.2 Diet*

Diet has been a cornerstone in the management of the disease even since early in the 21<sup>st</sup> century. Diets have been looked at as a way to assist in managing diabetes, with restricted carbohydrate intake being a common thread between them all (Naheed, 2011:11).

Carbohydrates are sugar; simple carbohydrates, due to being easily absorbed, result in rapid increases of blood glucose (Naheed, 2011:12). As diabetics have difficulty or an inability to produce insulin, this poses a problem. The body simply cannot react appropriately fast enough. Diabetic patients have to constantly be aware that carbohydrates are just another way of saying sugar. The balancing act is ensuring that the food consumed meets nutritional needs while also ensuring that there is not an excess of sugars that will be released into the blood.

For a Type 1 diabetic patient, diet is crucial. Type 2 patients often have some ability to produce and utilise insulin while Type 1 patients do not. Utilisation of insulin replacement therapy is usual in the management of Type 1 patients and means that they need to constantly monitor their diet in order to know when and how much to inject.

When starving, Type 1 diabetics rely on alternative sources of energy within the body such as ketones which can cause diabetic ketoacidosis (DKA) (Naheed, 2011:11). DKA is the body’s response to try to release energy. Unfortunately for a diabetic, the increased blood sugar could be fatal. Although diet is useful in assisting with the management of diabetes, there are also risks associated with the treatment of diabetes through changes in diet. Type 2 diabetics could benefit from starvation-type diets and massive reduction in carbohydrate intake.

Unfortunately, Type 1 diabetics might place themselves at risk should they engage in starvation-type diets.

This highlights an important difference between Type 1 and Type 2 patients. For Type 2 diabetics, lifestyle can often replace treatment, but those with Type 1 require insulin injections in addition to lifestyle (Naheed, 2011:3). Type 1 patients simply no longer have the ability to produce insulin themselves and will need insulin replacement balanced in such a way as to match their lifestyle.

### *2.7.3 Exercise*

Physical activity/exercise not only serves to protect against many of the complications common to diabetes, but also assists in the management thereof (Centers for Disease Control and Prevention, 2008:1). A further benefit of exercise and activity is the benefit to the patient's mental health, which could offset a diabetic patient's predisposition to conditions such as depression and burnout (Cooper, 2011:6).

Fitness and activity are essential for health and wellbeing (Cooper, 2011:4). Inactivity is seen as the fourth leading risk factor for mortality globally and is responsible for around 6% of all deaths each year (Cooper, 2011:4).

## **2.8 Motivation and its impact on lifestyle**

Lifestyle is largely driven by motivation. The term motivation refers to “the reasons underlying behaviour” (Lai, 2011:5). Motivation determines whether action will be taken and thus becomes the cornerstone of any lifestyle intervention. For lifestyle change to be observed, behaviour has to change; consequently actions need to be taken continually until a certain behaviour becomes integrated into the day-to-day life of the individual.

Within the study, various efforts were taken to equip respondents with all they require to change their lifestyle. Respondents were motivated throughout to take action through utilisation of a combination of both intrinsic and extrinsic rewards.

The patient need model looks at: A) Self: self-efficacy and motivation, B) Family and friends: support and acceptance, C) Community: access and opportunity and D) Society: support and acceptance (The diabetes epidemic and its impact on Europe, 2012:22). The patient need model illustrates the areas of support required to achieve self-care. The patient need model highlights an area often forgotten – that is, the impact of the environment in which one lives on one’s motivation.

Previous research on diabetes education often focused on short-term biological outcomes, and not the effect on motivation and lifestyle (Vallis et al., 2005:193).

## 2.9 Educational group work as a means to facilitate lifestyle change

As a healthcare social worker working at Kalafong Hospital, the researcher observed the need for creative means to address the poor treatment outcomes of diabetic patients. The researcher experienced patients as passive recipients of healthcare, the result being poorly controlled diabetes.

Educational groups are primarily focused on learning and helping members to practically apply various skills and capabilities and on allowing members to experience profound change due to the therapeutic effect of groups (Toseland & Rivas, 2005:23-24).

The therapeutic effect of groups can be attributed to the following factors:

- Groups instil hope within people and allow them to see that they aren’t alone.
- Groups allow for sharing of information through discussion, role play and imitation.
- Within groups, people can share information, experience altruism and develop socialisation techniques.
- Groups allow for people to build relationships and express feelings, emotions and ideas (Oliveira et al., 2008:434).

When looking at the study at hand, group dynamics played an important role. The lifestyle intervention project aimed at achieving sustainable change within the individual patients

through the utilisation of group dynamics, as the group members were encouraged to actively learn from and educate one another.

An investigation into the effectiveness of group education versus individual education of diabetic patients revealed that groups were equally if not more effective at educating patients. Moreover, group work had the added benefit of reducing costs, manpower and time required to reach multiple patients (Rickheim et al., 2002:269).

These considerations are incredibly important within the context of the South African public health system where the majority of individuals are from lower income groups, many of whom are impoverished, thus necessitating the need for cost-effective interventions.

When considering the power of groups, the aims of the lifestyle intervention and the benefit of reduced time and manpower required, together with the need for South Africans to be enabled and empowered through education, skill and capacity building, the lifestyle intervention not only benefits many impoverished people, but also enables and encourages them to become active members within their communities, educating the community about diabetes.

This study investigated the impact of the lifestyle intervention on the motivation of Type 1 diabetic patients. The study formed part of a larger multi-disciplinary research project run by the University of Pretoria's Department of Internal Medicine. This project aimed to implement a six-week supportive education programme. The content of the intervention is discussed in more detail within chapter 3. The lifestyle intervention provided an opportunity to further the field of knowledge whilst enabling and empowering the respondents (Department of Internal Medicine, 2012:5).

## 2.10 The role of the hospital social worker in lifestyle intervention

- Social workers are involved with discharge planning and the psychosocial care of patients as well as their families (Gregorian, 2005:3). General functions which the social worker within a healthcare setting fulfills are (Gregorian, 2005:4; National Association of Social Workers, 2011:1-2):

- Assessment
  - Family's social situation, patient and family dynamics, capacity of patient to cope with the illness, treatment and hospitalisation
  - Identifying barriers towards treatment or discharge
- Clarifying communication between i) patient and medical team, ii) patients' family and medical team and iii) the various members of the multi-disciplinary team
- Counselling
  - Offering emotional support
  - End-of-life, grief and bereavement counselling
- Identifying possible abuse as well as dependencies
- Crisis intervention
- Patient education and research (Includes advocating patient rights)
- Facilitation of decision making
- Maintain strong personal/professional boundaries.

In order to fulfill the above functions, the social worker needs to be able to easily adapt, assess situations quickly and be able to arrive at creative/unique solutions that meet both the patient's and the organisation's needs (Gregorian, 2005:7).

The roles a social worker fulfils place them in a unique position as he or she can facilitate lifestyle change by presenting information in a way that the patient and his/her family understand. The social worker can educate and bridge the divide between the medical team and the patient and, in so doing, also improve the patient's understanding as well as his/her health literacy.

## 2.11 Summary

The conceptualising of chapter 2 is the bridge between the literature and the findings of the study. This section highlighted the need for innovation regarding patient treatment, the South African context, the unique disease that is diabetes and the way social work can assist in patient care through lifestyle intervention and using group work methods and skills.



Chapter 2 looked at: the biopsychosocial perspective, the history of diabetes, types of diabetes, complications of diabetes, the effect of lifestyle on diabetes, treatment of diabetes, the South African context, lifestyle intervention, motivations impact on diabetes, the role of educational group works in facilitating lifestyle change and the role of the social worker.

Within the study, the researcher aimed at assessing the biopsychosocial impact, using the HbA1c to be able to assess the “bio”, and the modified scale/questionnaire to assess “psycho” and “social”. Through utilising Kalafong Hospital and the Type 1 patients, the study provides a snapshot of the community and the impact that a lifestyle intervention can have during a short six-week period.

The study utilised social work skills and group methods to achieve the desired outcomes and impact on patient motivation. The study also shows the role the social worker can play in a healthcare setting. Social workers establish and run lifestyle groups as well as serve as intermediaries between medical staff and the patient/family. The study demonstrated how a multi-disciplinary team can pool their experience and knowledge for the benefit of both patients and the employer, the benefit to employer being saved time and costs.

When viewed together, all of the above paint a picture of the Type 1 diabetic patient within the South African context. The picture is then coloured with the treatment options available, as well as the effect that both lifestyle and lifestyle intervention can have on the diabetic patient.

This section also starts to inform the reader of how the biopsychosocial perspective will be used to interpret the findings. This will be discussed in more detail in chapter 3.

## Chapter 3: Research Methodology and empirical findings

### 3.1 Introduction

The previous chapter explored diabetes mellitus, the treatment thereof within a South African context, lifestyle intervention and the role of the social worker in facilitating lifestyle intervention through group work. The South African healthcare system was discussed and the theoretical framework on which the study was based was outlined. The previous chapter also showed the severity of diabetes as well as its complications. This was coupled with a discussion on the treatment of diabetes and the important role of lifestyle in the management of Type 1 diabetes.

In this chapter the research methodology, ethical considerations and empirical findings are discussed. This serves to test the research hypothesis: **"When exposed to lifestyle intervention, Type 1 diabetic patients will show a reduced HbA1c which will be sustained over a three-month period."**

### 3.2 Research methodology and ethical considerations

#### *3.2.1 Research approach*

Due to the nature of this study, the researcher made use of the quantitative approach. The selection of the quantitative approach was informed by the fact that the researcher wished to: i) objectively measure isolated variables; ii) use deductive logic to generalise about the impact of lifestyle intervention and iii) control the isolated variables to allow for replication of the findings if appropriate (Fouché & Delport, 2011:63-66).

The researcher utilised both numerical measurements and various non-parametric tests. This facilitated data collection. The specific aim of the research was to assess motivation unique to each individual. To do this, the researcher used HbA1c, control and ability as variables throughout this study.

The researcher looked at the HbA1c value to determine whether the intervention had any effect on the blood glucose. The researcher assessed each individual's perception of control and whether the individual's perception of control was based on an internal or external locus of control. This was achieved through the use of a modified questionnaire. Finally, the researcher looked at perceived ability. Perceived ability was measured by evaluating the individual's sense of empowerment.

### *3.2.2 Type of research*

The researcher performed applied research. The type of research could be further categorised as summative evaluation research as the aim of the research was to evaluate the effect or impact of the lifestyle intervention on the motivation of diabetic patients (Fouché, 2011:459; Fouché & de Vos, 2011:98). This summative evaluation research was achieved by employing an impact or outcome evaluation.

Impact or outcome evaluation serves two functions: evaluating the outcome and measuring the short-term impact of a programme (Fouché, 2011:459). This type of evaluative research allowed the researcher to comment on the programme's/intervention's ability to reach the goals it set out to achieve, as well as determining other outcomes – intended or not (Fouché, 2011:459).

### *3.2.3 Research design*

The researcher opted for a true experimental design. This design was chosen for its ability to accurately provide the data required to measure the impact of the lifestyle intervention on the motivation of diabetic patients within Kalafong Hospital. The true experimental design allowed for results to be generalised to the population at Kalafong Hospital through utilisation of both randomisation and a control group (Fouché, Delport & de Vos, 2011:151).

From the true experimental designs, the researcher chose to utilise the randomised pre-test/post-test control group design. Also known as the classical experimental design, this design

utilises both a control and experimental group, thereby increasing the reliability and validity of the research (Fouché, Delport & de Vos, 2011:151).

The selected Type 1 diabetic patients were randomly divided into two groups. One group of patients served as the control group and the other group served as the experimental group. The researcher conducted a pre-test and post-test. The post-test was conducted three months after the intervention had concluded. The post-test measured whether motivational change was maintained after termination of the project.

This design was better suited to the research context than other true experimental designs. The design allowed the researcher to gather and compare data whilst ensuring that costs were not increased unnecessarily, as would have been the result of a design such as the randomised Solomon four-group design (The Solomon four-group design requires, as the name indicates, four groups). The researcher also found the chosen design to be superior to the randomised post-test only control group design, as the researcher could implement the pre-test.

The addition of a post-test assists in analysing the results by adding time as a variable.

#### *3.2.4 Details of the implementation of the randomised pre-test/post-test control group design*

After respondents had been selected (sampling is discussed in detail later), the researcher performed the pre-tests. The pre-test consisted of patients (respondents) completing a group-administered questionnaire and having their blood taken by a medical professional. These provided the baseline measurement of the patients' motivation and HbA1c.

After having established a baseline value, those who were part of the experimental group were taken through the lifestyle intervention programme. The lifestyle intervention programme consisted of six group work sessions. Three months after completion of the lifestyle intervention group work programme, a post-test was conducted, the patients (respondents) completing an individually-administered questionnaire and having their blood taken by a medical professional.

These measurements allowed the researcher to determine the sustainability of the changes in motivation of both the experimental and control groups. This allowed for discussion regarding the effect of the project on motivation both at the start of the programme and after three months.

The venue where both pre- and post-tests were conducted was the TV room (floor 1, main building) within the Kalafong Hospital complex, where the lifestyle intervention was presented. In total there were two measurements for both the experimental group and control group. The two measurements formed the pre-test and post-test. The questionnaires were administered as follows: the researcher utilised a group-administered questionnaire for the pre-test and an individually administered questionnaire for the post-test. The venue provided adequate seating for respondents and allowed for silence, comfort, control and safety. Both the experimental and control groups were debriefed by the researcher after each measurement. Respondents were informed of how the information would be used and opportunity was provided to raise any issue that may have arisen during the response time. Should any participants have needed further support and debriefing, the researcher would have done so both personally and through referral to the hospital psychologist. However, this was not necessary.

This study utilised diabetic patients attending the Diabetic Clinic within Kalafong Hospital as the research population.

### 3.3 Research methods

Below follows an explanation of the research methods used in the study. The researcher discusses sample and sampling method, data collection methods, methods of data analysis, reliability and validity and the pilot test of the study.

### 3.3.1 Study population, sampling and sample

#### 3.3.1.1 Study population

The population for the study was Type 1 diabetic patients between the ages of 18 and 40. This was limited by the geographical context of the study to only accommodate Type 1 diabetic patients from Pretoria who attended the Diabetic Clinic at Kalafong Hospital. The sample was thus taken from the population of Type 1 diabetic patients aged between 18 and 40 who attended the Diabetic Clinic at Kalafong Hospital. The population served to set a boundary on the universe by identifying individuals within the universe who possessed a certain characteristic – the characteristic in this case being diabetic patients (Strydom, 2011a:223).

The number of Type 1 patients at Kalafong Hospital (having attended at least one clinic visit in 2014) aged between 18 and 40 was 187 (n=187).

**Table 3.1: Population of the study**

Identifiers	Amounts according to identifier
Gender	74 Male (40%) 113 Female (60%)
Race	164 Black 2 Coloured 2 Indian 19 White
Age	Median 30 Most common age 31 Youngest 18 Oldest 40
Age distribution	1-20 years: 31 patients: 16.9% 21-40 years: 156 patients: 83.1%

Due to the nature of Type 1 diabetes, the sample size for this study was 38 respondents, 19 for each of the control and the experimental group. The sample represented individuals taken

from the population who were studied in order to understand the population as a whole (Strydom, 2011a:224). It is accepted that the larger the population, the smaller percentage thereof will have to form part of the sample (Strydom, 2011a:224), the reason being that the larger a sample becomes, the more insignificant smaller deviations become (Strydom, 2011a:224).

The sample size of this study was 38 respondents; 19 for the experimental and 19 for the control group. This allowed for limited generalisation and looked at drawing inference regarding the impact of the project on Type 1 diabetic patients within Kalafong Hospital itself and not the general public.

### **3.3.1.2 Sampling method and sample**

The researcher chose to utilise probability with stratified random sampling. This choice was informed by the knowledge that:

- The population was homogeneous in that all members had diabetes.
- The researcher had access to a complete list of all those who would be participating in the lifestyle intervention (Strydom, 2011a:228). Permission for this was granted by the University of Pretoria's Department of Internal Medicine, and the CEO of Kalafong Hospital. Research ethics approval was also obtained from the Faculty of Health Sciences and Humanities as part of a larger multi-disciplinary project.
- Through stratified random sampling, the researcher was able to ensure different groups or segments were represented to account for age and gender (Strydom, 2011a:230).

In the study, the researcher obtained lists containing the names, races, ages, past blood results and genders of patients with diabetes who were enrolled to attend the lifestyle intervention at Kalafong Hospital.

Inclusion criteria into the patient population were as follows:

- must have been diagnosed with Type 1 diabetes 12 months previously

- were aged between 18 and 40, of any race and of both genders
- were attending the Diabetic Clinic
- were conversant in English or Afrikaans
- were able to read or understand English as to be able to complete the questionnaire and scale
- were willing to participate in the study voluntarily.

The exclusion criteria were patients suffering from late diabetic complications or concurrent psychiatric or terminal illness.

Stratified random sampling ensured that all segments within the population were represented percentage-wise. Thus race and gender were representative of the larger population, as discussed below (Strydom, 2011a:230). Age, however, could not be sampled in a stratified manner as the duration of the study only permitted respondents up to the age of 40 to be incorporated into the study.

The population was divided into strata according to race and gender to ensure representation. Following the stratification, random sampling occurred by assigning a unique number to each member in the various strata; then, using a table of random digits, the researcher read vertically and wrote down all the sets of two digits (only two digits, as the sample size was only 38 respondents) until the sample was filled (Strydom, 2011a:228). The selection method was similar for the selection of both the experimental and control group, thus allowing for both control and experimental group to be homogeneous.

A total of 38 Type 1 diabetic patients (n=38) were selected for this study, all of whom voluntarily participated in the lifestyle intervention programme. Nineteen were assigned to the experimental group and nineteen to the control group.

From the 38 respondents, 17 formed part of the experimental group and 21 formed part of the control group. The difference in number of respondents was due to attrition. There were



initially 21 respondents in both the experimental and control group but only 17 respondents completed the intervention. Those who fell out of the study did not complete enough sessions for their data to be used. They also failed to complete the post-test.

### *3.3.2 Data collection methods*

This study used both a modified questionnaire and a blood test as data collection methods. The blood-test used was the HbA1c test.

HbA1c or glycated haemoglobin is the result of haemoglobin (“a protein within red blood cells that carries oxygen”) and glucose mixing in the blood (Diabetes UK, 2015). We can measure the HbA1c in the blood to get an indication of the average blood sugar levels over the past few months, with the desired or ideal value for a diabetic patient being 6.5% (Diabetes UK, 2015).

The modified questionnaire was based on the Diabetes Empowerment Scale-Short form. The Diabetes Empowerment Scale and HbA1c blood-test are discussed below. Scales consider the degree with which the various items reflect the variable being measured and provide more information than an index which would simply accumulate scores (Delport & Roestenburg, 2011a:207).

During the pilot testing of the scale, it became evident that the respondents did not understand this scale and were unable to accurately answer the questions. This led the researcher to design a modified scale which used very basic sentence structure and allowed for both open and closed questions. The questionnaire was utilised to broadly collect data on the programme and allowed the researcher to have access to some additional variables not included in the original scale.

The scale used as the basis of the questionnaire was the Diabetes Empowerment Scale- Short Form. This scale, having been proven to be a valid and reliable measuring tool to determine a diabetic patients’ sense of self-efficiency, allowed the researcher to identify questions that measured whether patients felt they were able to perform the required lifestyle changes

(Anderson et al., 2000:739). This was valuable, as patients cannot experience motivation to change without feeling self-sufficient in their ability to do so.

The modified scale was combined with a questionnaire (See Attachment A) asking patients questions about perceived motivation and diabetes care. The group-administered questionnaire method was utilised as it allowed for the researcher to be present and clarify uncertainties, whilst saving time and money (Delpont & Roestenburg, 2011b:189). Structured interview sessions were arranged for the respondents who lacked the required literacy to independently complete the questionnaire (Delpont & Roestenburg, 2011b:182). Data collection was in person during the first session of the lifestyle intervention at Kalafong Hospital. The post-test was conducted after three months, during the patients' scheduled follow-up at the medical out-patient department within Kalafong Hospital.

Two examples of questions were:

1. What do you have to do to take care of your diabetes?
  - Open question.
2. Are you satisfied/ happy with the amount of time it takes?
  - Yes
  - No

Within the study, open-ended questions were grouped and coded. Closed-ended questions were merely counted for analysis through frequency distribution.

Both the pre- and post-test were conducted in a similar manner. The researcher explained the nature of the study, ensured all the forms such as informed consent were completed, then discussed each question within the questionnaire. After discussion, the researcher provided each respondent with the questionnaire and gave them a set amount of time to finish completing all the questions. Once completed, the researcher collected the completed questionnaires. Following each measurement, the researcher debriefed the group. Debriefing involved allowing members to ask questions and ensuring that there was no emotional or

physical harm caused to any respondent during the test. None of the respondents needed to be referred for further counselling.

- **Content of the lifestyle intervention programme**

As mentioned previously, the lifestyle intervention consisted of six group work sessions. The content of the sessions can be found in appendix I (see Appendix I). The programme was created by the multi-disciplinary team. Each member added from their own field of expertise to ensure both a holistic approach and a balanced program for the participants.

The sessions covered the following: Type 1 diabetes, testing, exercise, diet, locus of control, goal setting, diabetes and alcohol, sick days, contingency planning, food labelling, stress, burnout, depression, sexual health and social integration.

Each group work session took two to three hours to complete. The sessions were educational groups, including presentations, practical application and review of what had been learnt.

- **The measuring instrument**

A modified questionnaire was utilized, as previously discussed (see attachment C). The questionnaire consisted of four sections with a total of 18 questions. Of these 18 questions, 10 were used for this section. The remaining eight questions were not understood by all the respondents and the answers were not usable.

The questionnaire made use of both open and closed questions. An example of open question was: “Question 1: What do you have to do daily to take care of your diabetes?”

An example of a closed question was:

“Question 4: Are you satisfied or happy about the amount of time it takes?”

Respondents were unaware that the questionnaire aimed at evaluating the change that the intervention had had. This was explained prior to the post-test.

- **The pre-test and post-test**

Both the pre-test and the post-test were conducted in the following manner, the only differences being that the post-test was three months after the pre-test and the method of administering the questionnaire was different. The questionnaire was administered utilising a group administered questionnaire for the pre-test and individually administered questionnaire for the post-test. (Respondents completed the post-test during their follow-up visit to the hospital.)

- Respondents were provided with copies of the informed consent. The content of the informed consent was explained, after which those who decided to proceed with the study were directed to a medical personnel member to complete the blood-tests.
- The respondents each completed both a blood-test and a questionnaire. The blood-tests were conducted by medical personnel and the HbA1c was tested for each respondent.
- The questionnaires were handed out and completed within the group (group administered questionnaire) during the pre-test and individually during the post-test. Respondents were given instructions and the opportunity to ask questions for any areas where they felt uncertain.

### *3.3.3 Data analysis methods*

The researcher presented the data as follows. The plan was to use bivariate analysis, as the study looked at the relationship between the lifestyle intervention and the motivation of Type 1 diabetic patients (Fouché & Bartley, 2011:251). The researcher eventually used a univariate and a frequency analysis. The reason behind this is discussed below in the data analysis. Univariate analysis considers one variable and describes that variable according to the patterns found (Statistics How To, 2015).

The study aimed to see whether motivation and lifestyle intervention were associated, then identified the nature of the association. On starting the study, it was believed that the intervention would have an effect on the motivation of the respondents, which would be measurable through the questionnaire and blood-results.

The data gathered within the study was initially planned to be presented using a scattergram. This would have illustrated the relationship between the variables and allowed the researcher to comment on the possibility of prediction (Fouché & Bartley, 2011:269). The researcher used a simple box and whisker graph in the end. The reason for the deviation from a scattergram to a simple box and whisker graph is discussed below in the data analysis.

After the data had been collected, data was prepared, coded and given numerical values (Fouché & Bartley, 2011:252). During the data preparation, the researcher enlisted the help of a professional in the field of statistical analysis to assist in ensuring proper analysis of the data.

The researcher prepared the data by coding, assigning numerical values and reading in the data, after which an analyst assisted in analysing the data using the computer software, Statistical Package for the Social Sciences (SPSS).

The questionnaires were analysed through use of simple frequency distribution and non-parametric tests (Fouché & Bartley, 2011:255). Throughout the findings reference was made to the change in p-value (probability value). A change is considered as significant if the p-value is less than 0.05 ( $p\text{-value} < 0.05$ ). A value above 0.05 could indicate a tendency towards change (Freeman & Campbell, 2007:12). In order to obtain the p-value, non-parametric tests were conducted.

The researcher utilised the following non-parametric tests:

- Wilcoxon Signed Rank Test
- Mann-Whitney U Test

The above tests were used as the population within the study was not normally distributed (Carl von Ossietzky Universitat Oldenburg, 2015).

The Wilcoxon signed rank test is used to compare data within the same group (dependent samples), e.g. experimental or control group (Carl von Ossietzky Universitat Oldenburg, 2015). The test uses ordinal data. Ordinal data can be described as data where a higher value is assumed to be better than a lower value. An example from the study would be the question

about how respondents manage their diabetes. A participant who manages their condition with treatment, diet and exercise will, according to an ordinal scale, be considered to be better than a participant who only uses treatment.

The Mann-Whitney U test is similar to the Wilcoxon signed rank test, but compares data between groups (independent samples) such as between the experimental and control group (Fay, 2015:1). This test also uses ordinal data.

The researcher further made use of the McNemar Test in order to compare paired binary data (Fay, 2015:1). Paired binary data compares a question within one group. The question will have only two possible answers. Because of the binary nature of the response, a Wilcoxon Signed rank test cannot be used. (The data is not ordinal.)

The researcher then utilised only the most significant frequencies for discussion. (The researcher considered any frequency above 25% as significant.) The findings were discussed and reference was made to the researcher's expectations and findings. These findings can be found below under non-parametric test results.

The blood results were analysed using SPSS (Statistical Package for the Social Sciences). The results were analysed by using a univariate analysis. The univariate analysis made use of the T-test. The T-test "compares the means between two unrelated groups on the same continuous, dependent variable" (Leard Statistics, 2015). Within the study, the unrelated samples were the experimental and control group and the dependent variable was the HbA1c.

The aim of the T-test is to see if the data fits the hypothesis. To do so it considers deviation in the data. The best outcome or outcome that would prove one's hypothesis is when there is no deviation. This is referred to as a null hypothesis, meaning the data matches the hypothesis (PennState, 2015).

The researcher decided to utilise a univariate analysis of the blood results which deviated from the initial plan of performing a bivariate analysis. The reason for the deviation follows. Initially the researcher was going to utilise a standardised scale as well as the blood results. The plan was that the standardised scale would offer a single numerical variable for each participant

which would reflect their perceived self-efficacy. This score would be used to depict a large portion of the respondents' motivation. This self-efficacy/motivation score would then form one of the two variables in the bivariate analysis.

Unfortunately, having had to change from a standardised scale to a modified questionnaire meant that the results of the questionnaire would be better analysed using themes. The change from standardised scale also meant that the data collected from the questionnaire could not be accurately coded into a single score or variable. The researcher found it prudent to rather separate the findings of the blood results and the questionnaire because both would provide more reliable data if examined separately.

The researcher also decided the data would best be presented using a simple box and whisker graph as a scattergram would be ill suited for the purpose of analysing univariate data. The simple box and whisker graph also allowed for the 25 and 75 percentile to be shown together with the mean value. This allows the reader to have a better understanding of the effect that the lifestyle intervention has on the respondents' HbA1c.

#### ***3.3.4 Reliability and validity of the Diabetes Empowerment Scale - Short form***

Reliability was maintained in this study, by ensuring conditions were similar during both tests; furthermore, the researcher conducted a pre-test before the lifestyle groups and a post-test three months after the lifestyle intervention groups, utilising the same questionnaire (Aldowaisan & Alnaggar, 2011:2). The questionnaire was pilot tested to further increase reliability.

Internal validity was increased through the use of a randomised control and experimental group; external validity, however, remained poor due to the small sample size and use of a modified scale (Handley, 2001:1).

The Diabetes Empowerment Scale (DES) was originally developed in 2000 to measure psychosocial self-efficiency regarding diabetes (Anderson et al., 2003:1641). This scale was

shortened from 37 items to eight in order to allow for a brief assessment of self-efficacy and became known as the Diabetes Empowerment Scale-Short Form (DES-SF).

Originally the reliability of the DES-SF was  $\alpha = 0.85$ , a number that was subsequently revised (following administration of the DES-SF to 229 subjects) to 0.84 (Anderson, et al., 2003:1642). The DES-SF is also recognised, and used, by the University of Michigan, Health System (Michigan Diabetes Research and Training Center, 2013). Due to the difficulty of respondents answering and understanding the DES-SF, the researcher devised a modified scale or questionnaire which focused on the same areas targeted by the DES-SF.

### 3.4 Pilot test

#### *3.4.1 Feasibility*

The aim of the study was feasible as the programme ran within Kalafong Hospital. The researcher, being employed at Kalafong Hospital, could proceed without travel costs being a concern. Furthermore, the researcher could book venues thereby ensuring that both the pilot study and the main study were conducted within the hospital premises, allowing easy access to the respondents.

The population was accessible, as Kalafong Hospital has a well-established Diabetes Out-Patient Clinic. The group sessions were held during working hours, resulting in the researcher not having to apply for leave. The researcher had, as part of the terms of his employment, been given permission to complete his studies and had departmental support from the Social Work Department, Department of Internal Medicine and the CEO of Kalafong Hospital to complete his studies.

The impact of the programme was determined by undertaking impact or outcome evaluation research (Fouché, 2011:459). The criteria for determining the impact of the lifestyle intervention on the motivation of diabetic patients were feasible, as the researcher formed part of the multi-disciplinary study team who ran the lifestyle intervention (Department of Internal Medicine, 2012:19). The researcher had also been granted permission to conduct the study by



the CEO of Kalafong Hospital, as well as the Ethics Committee of both the Faculty of Humanities and the Faculty of Health Sciences, University of Pretoria.

### *3.4.2 Pilot test*

During pilot testing, it became evident that the DES-SF was unsuitable for the respondents and the scale was modified. The scale was simplified in that questions were restructured into clearer questions using basic terms and limiting responses to simple yes/no answers. This eliminated the issue where respondents did not understand how to answer on a Likert scale.

The pilot test allowed for the precision of the study to be increased through the testing of proposed procedures and data collection methods (Strydom, 2011b:236). Due to the utilisation of a questionnaire, a pilot test was needed. Similar to the main study, a randomised sample was selected. During this test, the suitability as well as the validity and reliability of the questionnaire administered in a group were tested, allowing for changes to be made prior to the main study (Strydom, 2011b:237).

The pilot test of the questionnaire was carried out with ten Type 2 diabetic respondents who did not form part of this main study. These individuals were homogeneous to those who formed part of the Type 1 lifestyle intervention in all regards except for being Type 2 diabetic patients. The questionnaire was tested with them as a pre-test and the necessary changes made to the questionnaire.

Selection of the pilot test was done in a similar manner to the selection of those who formed part of the main study. The pilot test found that the DES-SF was ill-suited for the study population. The researcher, having tested the DES-SF on 160 Type 2 diabetes patients, found that health literacy among the respondents was too low for the scale to be of use. Following this, the researcher set up a questionnaire targeting the same aspects as the DES-SF. This questionnaire made use of open and closed questions as well as simple yes/no questions. During the pilot testing of this questionnaire, respondents were able to engage and answer the questions in a satisfactory manner.

## 3.5 Ethical considerations

Considering all of the above, the following ethical issues were highlighted as areas of concern: voluntary participation, informed consent, violation of anonymity, denial of treatment, debriefing of respondents, actions and competence of the researchers, and publication of findings. The reasons for having highlighted the following ethical issues follow, together with the means used to address these issues.

### *3.5.1 Voluntary participation*

The researcher felt that respondents could feel obliged to participate in the research, as they might see the research as part of the programme and think that refusing might result in them being discriminated against at the clinic (Strydom, 2011c:117). To counteract this, the researcher actively informed members that the study would in no way influence the treatment they receive at Kalafong Hospital and that they had the right to refuse or withdraw at any time without any consequences; he encouraged other administrators within the programme to do the same.

### *3.5.2 Informed consent*

All the respondents were given a choice of whether or not they wished to participate after having been informed about what participation would entail. The researcher attained informed consent by ensuring that respondents were aware of the purpose of the study, its goal and objectives, the methods of data collection and possible advantages or disadvantages of being part of the study (Strydom, 2011c:117; Social Action Research, 2003:21). This information was presented in a manner that was clear and easy to understand. Also, each respondent signed a letter of informed consent prior to the study commencing.

The researcher ensured that all of the instructions (both verbal and written) were easy to understand. The researcher ensured no difficult terms were used and also allowed sufficient time for respondents to clarify any confusion.

### *3.5.3 Violation of anonymity/confidentiality*

As the researcher was present to conduct the study, anonymity was not possible. The researcher did, however, compensate for this by emphasising to respondents that their responses as well as their identities would remain confidential (Strydom, 2011c:119; Social Action Research, 2003:55). Confidentiality was maintained through assigning numbers to respondents and removing identifiable criteria from all parts of the data and the report.

### *3.5.4 Denial of treatment*

Through the study utilising an experimental design, the control group was initially denied treatment. Treatment refers to the lifestyle intervention workshop. Pure denial of treatment is considered unethical and the researcher addressed this by emphasising that the lifestyle intervention programme would be repeated for those who were not involved in the experimental group (Strydom, 2011c:121). Thus, the experimental group underwent the intervention first, measurements were taken and, after the data had been collected, the intervention was offered to the control group as well.

### *3.5.5 Debriefing of respondents*

The researcher ensured adequate time after each measurement to debrief the respondents and to provide respondents with the opportunity to ask questions and clarify misconceptions (Strydom, 2011c:122). The researcher did not have to refer any individuals to a social worker at Kalafong Hospital, as none displayed any signs of distress or trauma as a result of the lifestyle intervention or data collection.

### *3.5.6 Actions and competence of the researcher*

The researcher ensured that he himself had the adequate training, skills and competence to conduct the study in an ethical manner (Strydom, 2011c:123).

The researcher is a qualified social worker with a four-year Bachelors of Social Work degree. He was thus trained in counselling people and acting in an ethical manner. Necessary research

skills have been developed with the completion of a research project and mini-dissertation for his BSW degree, as well as successfully completing the postgraduate module: Research Methodology MWT 864. The researcher has worked in various hospital settings and has practical experience in working with various illnesses. Within these settings he has facilitated several support and educational groups.

### *3.5.7 Avoidance of harm*

Throughout the study, attention was given to ensure that no harm was brought to the respondents. The study did not cause any emotional or physical harm.

Avoidance of harm was achieved through thorough informed consent prior to initiation of the study and through careful planning during the curriculum development for the study (Strydom, 2011c:115). Potential risks of harm were assessed during the planning of each session.

## **3.6 Research findings**

This section provides the findings of the study. First and foremost, a biographic profile of respondents was provided, followed by both the findings from the questionnaire (frequency distribution and non-parametric test findings) and the blood test results (HbA1c results).

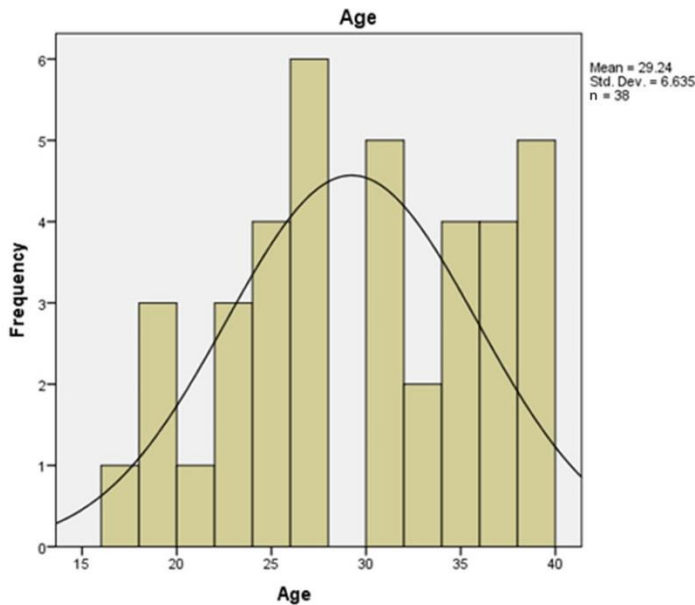
### *3.6.1 Biographic profile of respondents*

A total of 38 Type 1 diabetic patients (n=38) voluntarily participated in the lifestyle intervention programme. The biographical information which follows includes the respondents' age, race, gender and employment status.

As previously stated, all of the respondents attended the Diabetes Clinic at Kalafong Hospital. All of the respondents were already receiving the prescribed medical intervention for their diabetes. It was useful to look at the respondents' biographical profiles to better understand the effect of the lifestyle intervention within the context of Kalafong Hospital. It also assisted in comparing findings with other studies completed abroad.

- **Age**

Figure 1 shows the age distribution of the respondents. A discussion follows highlighting the role that age plays within the study.



**Figure 3.1: Age Distribution of entire sample (n=38)**

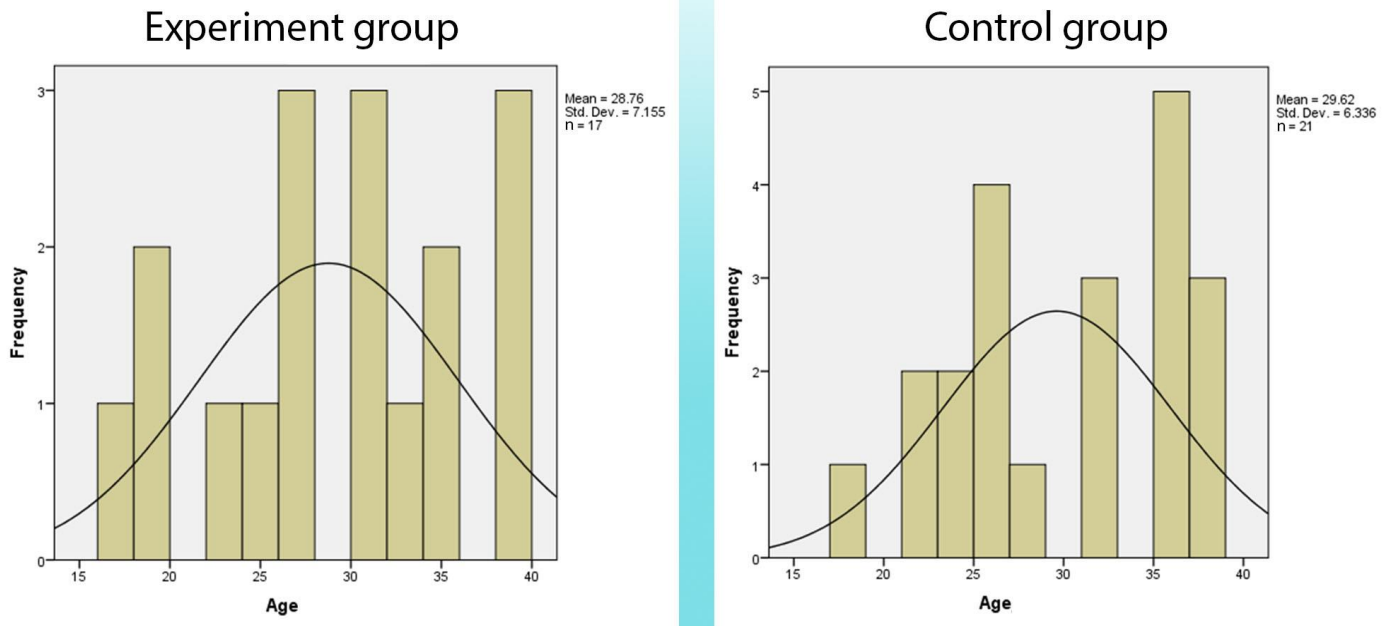
The mean age of the respondents was 29 years old at the time of the study. The youngest participant was 18 and the oldest 39. All of the respondents could therefore be placed within the life phase of young adulthood. It is during this life phase that, according to Erikson, individuals are facing the young adulthood dilemma of intimacy versus isolation (US Department of Health and Human Services, 2014).

In this phase individuals develop strong relationships. It is these relationships that help diabetic patients to feel motivated; as one of the respondents said: “I know I can live with diabetes as I have parents and siblings who all support me and encourage me to reach my goals and live healthy”.

Throughout the study, the research team encouraged the respondents to broaden their support network. Respondents were encouraged to build relationships where they could be open about their diabetes. It became clear that respondents had strong relationships with their families but

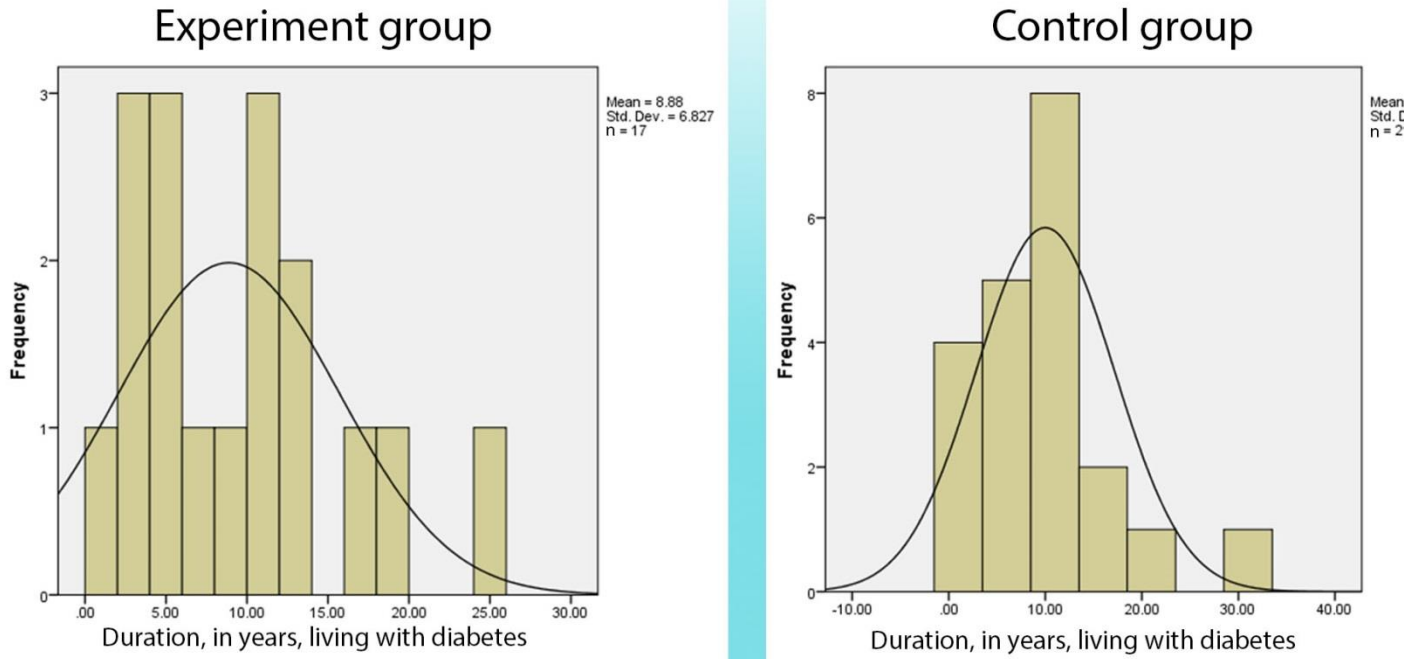
did not want to discuss their diabetes with their friends. This finding is investigated further in the discussion of theme 4: Sources of support.

Following are two figures illustrating the age distribution between both the experimental and control group. By examining the distribution, it became clear that the distribution was insufficient for the purpose of generalising the results of the study.



**Figure 3.2: Age distribution of both experimental and control group**

Age was also important within the study as most of the respondents had been diagnosed at a young age. This meant that the older respondents had lived with diabetes over a longer time. Living with diabetes for a longer time gave rise to an increased risk of complications. Within the study, the participant who had had Type 1 diabetes for the longest had lived with the condition for 30 years. The average length of having been diagnosed with diabetes at the time of the study was 9.5 years. This is presented in the following figure.



**Figure 3.3: Duration, in years, having lived with Type 1 diabetes (n=38)**

From the preceding figure, one can see a slight difference in the distribution of years of having lived with diabetes. The mean duration (in years) of having lived with diabetes was 8.88 for the experimental group and 10 for the control group. The control group also had a more even distribution whereas the experimental group did not.

A commonly held belief is that the longer an individual has lived with diabetes, the better his/her diabetes control will be. However, despite having lived nine years on average with Type 1 diabetes, the respondents within this study continued to struggle in the management of their own diabetes.

This illustrated how the management of diabetic patients through treatment alone was insufficient. The patients were not learning about their disease. They were not being motivated to take charge of their own diabetes management and, as a result, they showed no progressive improvement in the management of their diabetes.

- **Race**

Of the 38 respondents (n=38) 37 were Black and one was White (this is presented in table 3.2 following). When compared to the total population of the study, the researcher found that this meant that, at the time of the study, 87.7% (out of a total population of 187) of Type 1 diabetic patients seen at the diabetes clinic were Black.

**Table 3.2: Race distribution**

Race distribution				
Control group			Experimental group	
	Frequency	Percent	Frequency	Percent
Valid Black	20	17	17	100.0
White	1	4.8	0	0.0
Total	21	100.0	17	100.0

With the sample being 97.3% Black and the experimental group consisting solely of Black respondents, the researcher was unable to generalise findings to other race groups.

The unbalanced sample also raised questions of access to healthcare as well as choice of service provider. Most of the respondents did not have financial freedom. As such, most respondents were completely reliant on government medical services. Government facilities serve specified areas and individuals who were not financially able to go elsewhere were limited in their freedom to choose their healthcare provider.

- **Gender**

Figure 2 represents the gender distribution of the respondents. Of the 38 respondents (n=38) who participated in the study, 12 were males and 26 were females.



**Table 3.3: Gender distribution (n=38)**

Gender distribution						
Experimental group			Control group			
		Frequency	Per cent		Frequency	Per cent
Valid	Female	12	70.6		14	66.7
	Male	5	29.4		7	33.3
	Total	17	100		21	100

The distribution between male and female was unbalanced as 68% of the respondents were female. This supports the finding that women are more likely to be active respondents within their own healthcare. Women are more willing to acknowledge their own illness and are also more willing to seek help in dealing with their illness (Weiss & Lonquist, 2015:57).

The gender distribution between the experimental and control group was, however, similar enough to allow for findings to be generalised between the groups.

- **Employment Status**

Out of the 38 respondents (n=38), only 17 were employed at the time of the study. This is a major concern due to the link between diabetes and poverty, as discussed in chapter 2.

**Table 3.4: Employment status**

Employment Status						
Experimental group			Control group			
		Frequency	Per cent		Frequency	Per cent
Valid	Employed	7	41.2		10	47.6
	Unemployed	10	58.8		11	52.4
	Total	17	100		21	100

As seen in the preceding table, ten of the respondents were either students or scholars and seven were unemployed. “Scholar” here refers to those respondents completing their schooling (Grades 1-12) and “Student” refers to those completing a tertiary qualification.

**Table 3.5: Unemployed respondents**

Unemployed respondents						
Experimental group			Control group			
		Frequency	Per cent		Frequency	Per cent
Valid	Student	4	57.1		1	10.0
	Scholar	1	14.3		4	40.0
	Unemployed	2	28.6		5	50.0
	Total	7	100		10	100

The careers of the 21 employed respondents are listed in the following table (this was accurate at the time of the study).

**Table 3.6: Employed respondents' careers**

Employed respondents' careers							
Experimental group			Control group				
		Frequency	Per cent		Frequency	Per cent	
Valid	Care worker	2	20		1	9.1	
	Cashier	1	10		0	0	
	Community health worker	1	10		0	0	
	Customer services	0	0		1	9.1	
	Domestic worker	1	10		1	9.1	
	Driver	0	0		1	9.1	
	Gardener	1	10		1	9.1	
	Intern manager	0	0		1	9.1	
	Laundry	1	10		0	0	
	Merchandiser	1	10		0	0	
	Nurse	1	10		1	9.1	
	Promoter	0	0		1	9.1	
	Quality controller	0	0		1	9.1	
	Security	0	0		1	9.1	
	Census capturing worker	0	0		1	9.1	
	Technician	1	10		0	0	
	Total		10	100		11	100

From Table 3.6 there were 21 respondents who were unemployed. As discussed in chapter 2, lifestyle is the cornerstone of diabetes management. Without employment, access to a proper diet and maintenance of a healthy lifestyle becomes extremely difficult.

- **Housing**

Eleven (11) of the respondents resided in informal housing; this meant that a significant percentage of the respondents were exposed to structural barriers to the development and maintenance of a healthy lifestyle. The following table illustrates the housing circumstances of the various respondents.

**Table 3.7: Housing circumstances**

		Housing			
		Experimental group		Control group	
		Frequency	Per cent	Frequency	Per cent
Valid	Formal brick house	13	76.5	12	57.1
	Hostel	1	5.9	1	4.8
	Informal housing	3	17.6	8	38.1
	Total	17	100	21	100

The preceding table illustrates the frequencies of the respondents' housing situation. It is interesting to note that even though 11 respondents resided in informal housing, the majority of the respondents had some type of formal housing. This is especially true for the experimental group which had 82.4% of respondents living in either formal housing or hostels compared to 61.9% for the control group.

### 3.6.2 Non-parametric test results

The findings from the frequency distribution are presented, with literature included to substantiate the findings. Following are the tables that illustrate the findings from the questionnaires. The findings were generated through a comparison both within the groups and between the groups.

Table 3.8: Frequency distribution and non-parametric test findings (Experimental group)

<b>Experimental Group</b>						
	<b>Pre-Test (n=17)</b>			<b>Post-test (n=14)</b>		
<b>Value labels:</b>	<b>Value</b>	<b>Frequency</b>	<b>Per cent</b>	<b>Frequency</b>	<b>Per cent</b>	<b>p-value</b>
<b>1. Manage diabetes by using:</b>						
Testing	1	5	29.41%	8	57.14%	Wilcoxon Signed Rank Test 0.070
Treatment	2	13	76.47%	11	78.57%	
Diet	3	12	70.59%	11	78.57%	
Exercise	4	11	64.71%	11	78.57%	
<b>3. Time spent managing diabetes (per day)</b>						
0-1 hour	1	0	0.00%	0	0.00%	Wilcoxon Signed Rank Test 0.672
1-3 hours	2	8	47.06%	7	50.00%	
3 or more hours	3	7	41.18%	7	50.00%	
<b>3. Unhappy about diabetes management activities</b>						
Yes	1	3	17.65%	7	50.00%	McNemar Test 0.219
No	2	11	64.71%	7	50.00%	
<b>4. Satisfied with amount of time it takes to manage diabetes</b>						
Yes	1	13	76.47%	12	85.71%	McNemar Test 1
No	2	1	5.88%	0	0.00%	
<b>5. When sick, it is because of something in my control</b>						Wilcoxon Signed Rank Test 0.348

Yes	1	17	100.00%	13	92.86%		
No	2	0	0.00%	1	7.14%		
<b>Goals</b>							
<b>6. I know what a goal is</b>							
Yes	1	17	100.00%	14	100.00%	Wilcoxon Signed Rank Test (On goals as a whole)	
No	2	0	0.00%	0	0.00%		
<b>7. I know how to set goals</b>							
Yes	3	16	94.12%	13	92.86%		
No	4	1	5.88%	1	7.14%		
<b>8. I set goals regarding my diabetes</b>							
Yes	5	14	82.35%	13	92.86%	1	
No	6	2	11.76%	1	7.14%		
<b>9. Feeling about diabetes</b>							
Good	1	0	0.00%	2	14.29%	McNemar Test 1	
Neutral	2	7	41.18%	6	42.86%		
Bad	3	8	47.06%	6	42.86%		
<b>10. Support: Who do you talk to regarding your diabetes?</b>							
Family	1	13	76.47%	11	78.57%	McNemar Test 1	
Partner	2	5	29.41%	3	21.43%		
Doctors	3	1	5.88%	0	0.00%		
No one	4	0	0.00%	1	7.14%		

As mentioned previously, not all of the data could be compared using the Wilcoxon signed rank test as some of the data was not ordinal but binary. Thus, some of the data was compared by means of the McNemar test.

The preceding table clearly shows that none of the changes could be considered as significant. The p-values for question 1-10 were all above 0.05. As mentioned previously, a p-value of below 0.05 is considered as significant.

**Table 3.9: Frequency distribution and non-parametric test findings (Control group)**

<b>Control Group</b>						
	<b>Pre-Test (n=21)</b>			<b>Post-test (n=13)</b>		
<b>Value labels:</b>	<b>Value</b>	<b>Frequency</b>	<b>Per cent</b>	<b>Frequency</b>	<b>Per cent</b>	<b>p-value</b>
<b>1. Manage diabetes by using:</b>						
Testing	1	5	23.81%	5	38.46%	Wilcoxon Signed Rank Test 0.340
Treatment	2	11	52.38%	11	84.62%	
Diet	3	11	52.38%	11	84.62%	
Exercise	4	9	42.86%	5	38.46%	
<b>2. Time spent managing diabetes (per day)</b>						
0-1 hour	1	1	4.76%	1	7.69%	Wilcoxon Signed Rank Test 0.888
1-3 hours	2	12	57.14%	6	46.15%	
3 or more hours	3	8	38.10%	6	46.15%	
<b>3. Unhappy about diabetes management activities</b>						
Yes	1	6	28.57%	3	23.08%	McNemar Test 0.375
No	2	14	66.67%	10	76.92%	

<b>4. Satisfied with amount of time it takes to manage diabetes</b>						
Yes	1	14	66.67%	12	92.31%	McNemar Test 0.727
No	2	3	14.29%	1	7.69%	

<b>5. When sick it is because of something in my control</b>						
Yes	1	20	95.24%	10	76.92%	Wilcoxon Signed Rank Test 0.409
No	2	1	4.76%	3	23.08%	

<b>Goals</b>						
<b>6. I know what a goal is</b>						Wilcoxon Signed Rank Test (On goals as a whole) 0.785
Yes	1	13	61.90%	10	76.92%	
No	2	6	28.57%	2	15.38%	
<b>7. I know how to set goals</b>						
Yes	3	13	61.90%	10	76.92%	
No	4	6	28.57%	2	15.38%	
<b>8. I set goals regarding my diabetes</b>						
Yes	5	13	61.90%	9	69.23%	
No	6	5	23.81%	3	23.08%	

<b>9. Feeling about diabetes</b>						
Good	1	3	14.29%	2	15.38%	Wilcoxon Signed Rank Test 0.655
Neutral	2	6	28.57%	5	38.46%	
Bad	3	8	38.10%	5	38.46%	

<b>10. Support: Who do you talk to regarding your diabetes</b>						
Family	1	12	57.14%	13	100.00%	McNemar Test 1

Partner	2	2	9.52%	0	0.00%	
Doctors	3	0	0.00%	0	0.00%	
No one	4	1	4.76%	0	0.00%	

This table shows a similar picture to that of the previous table (Experimental group results). It is important to note that there were only 11 respondents who did not complete the post-test questionnaire and became unreachable after termination of the study. Despite the missing responses, though, the researcher did find the results to be congruent with the rest of the findings. That is, the intervention failed to produce a significant change (a change with a p-value of below 0.05).

- **Comparison between experimental and control group findings (Mann-Whitney U Test)**

The following table shows the results of the comparison between the experimental and control group. The comparison used the Mann-Whitney U test in order to compare the two groups.

**Table 3.10: Comparison between experimental and control group (Mann-Whitney U Test)**

<b>Comparison between experimental and control group (Result of Independent Samples Mann-Whitney U Test)</b>	
<b>Value labels:</b>	<b>Result</b>
1. Manage diabetes by using:	0.462
2. Time spent managing diabetes	0.867
3. Unhappy about diabetes management activities	*Not applicable
4. Satisfied with amount of time it takes to manage diabetes	*Not applicable
5. When sick, it is because of something in my control	*Not applicable
6. Goals	0.595
9. Feeling about diabetes	0.94
10. Support: Who do you talk to regarding your diabetes?	*Not applicable

As can be seen, there are some questions without a result. For some of the questions the Mann-Whitney U test could not be implemented. This can be seen by the \* Not applicable written in the result column. These are the questions which had to be compared within their



respective groups (dependent samples) using the McNemar test. It is due to the nature of the data that the Mann-Whitney U test cannot be used to compare the results.

From the results of the questions that were compared, it is clear that none of the p-values were below 0.05. This indicated that the effect of the intervention was not significant even between the groups. This means that respondents within the experimental group did not show significant change compared to those within the control group.

- **Discussion and interpretation of the frequency results and non-parametric findings**

Even despite the amount of incomplete answers within the control group, the findings overall remain insignificant. The p-values are all above the 0.05 threshold.

Despite no significant change being recorded, there are still lessons that can be learned from these findings:

- Management of diabetes within both groups was mainly achieved through treatment, diet and exercise.
- The majority of both control and experimental group respondents spent between one and three hours per day managing their diabetes.
- Most respondents were happy about the activities and time associated with the management of their diabetes.
- Almost all of the respondents showed that they had an internal locus of control as most indicated that when they were sick, it was because of something within their control.
- The majority of respondents knew what a goal is, how to set a goal and actively set goals regarding their diabetes.
- Most respondents felt bad about having diabetes.
- Family was the single most utilised source of support, with partners second. No one relied on friends and colleagues for support.

These findings are now discussed per variable in the questionnaire. The questions were grouped according to similarity to facilitate the discussion and provide better insight into the findings.

- **Management of diabetes**

Most respondents indicated that they relied on treatment and diet to manage their diabetes. This was the same both for the experimental and control group. This finding was consistent with expectations. This is true as current intervention for managing Type 1 diabetes at Kalafong Hospital is based predominantly on both treatment and diet.

As discussed in chapter 2, the treatment is insulin replacement therapy. This treatment requires multiple-dose insulin (MDI) injections which consist of three to four injections daily (American Diabetes Association, 2015:S41, Diabetes UK, 2007:12). Respondents clearly understood the importance of treatment, as 63.16% of them mentioned treatment as their main approach to managing their condition.

Respondents also further improved the management of their condition through the addition of exercise and diet to their treatment regime. Exercise and diet are part of a healthy lifestyle and are known to have positive effects for diabetic patients. Exercise can reduce blood pressure and improve fitness, well-being and social interaction (Kordi, 2007:52). Diet, on the other hand, affects how much insulin a person requires and directly affects the blood glucose.

These findings suggest that respondents were well aware of the role that treatment, diet and exercise played in managing their diabetes and indicated that respondents had a basic understanding of the pillars of treatment. Respondents knew the biological impact of their diabetes and employed treatment, diet and exercise to manage their condition. This meant that the education respondents received during regular treatment sessions at the Diabetic Clinic within Kalafong Hospital had succeeded in providing a basis, even if ways of practical implementation were lacking. It also showed that the respondents were psychologically able to provide self-care over extended periods.

- **Time spent managing diabetes**

The study found that most respondents (50% of the experimental group and 46.15% of the control group) spent above one hour per day managing their diabetes. The remaining respondents indicated that they either took less than one hour a day (0% of the experimental group and 7.69 % of the control group).

Interestingly, of those who indicated that they took more than three hours a day to manage their diabetes, most of them indicated they spent 24 hours a day managing their diabetes. This implied that they perceived their diabetes as something that required permanent management.

Perceiving the time required to manage one's diabetes as being 24 hours could psychologically result in the individual easily becoming burned out and feeling hopeless, frustrated and disillusioned (Diabetes UK, 2014).

From the biopsychosocial perspective, this psychological strain would negatively affect the biological component of diabetes as treatment would waver. The best way to protect against this psychological strain would be through social support. Reported sources of support are discussed later.

- **Factors or activities causing unhappiness**

Respondents indicated that they were satisfied with the activities associated with managing their diabetes such as testing, treatment, diet and exercise (50% of the experimental group and 77% of the control group). This could be interpreted in two ways. One, the respondents felt that they were self-efficient and able to manage their diabetes, thus causing them to be satisfied, despite the amount of time it might have required. Two, respondents might have indicated satisfaction as they had resigned themselves to the perception that they could not change their situation and, as such, should just continue in the management of their diabetes.

The amount of time it takes to manage diabetes showed that 85.71% of the experimental group and 92.31% of the control group indicated that they were satisfied with the amount of time required for managing their diabetes. This was surprising, as half the experimental group was

unhappy about the activities required to manage their diabetes and, later, the majority of the respondents indicated they felt bad about having diabetes.

The researcher expected the amount of time required to manage their diabetes to have a more negative association. Instead the respondents were satisfied with the time required, while being unhappy about the activity itself.

- **Perceived self-efficacy**

In the experimental group 92.86% and 95.24% in the control group indicated that they were aware that they could influence their health and their diabetes through the choices they made and the actions they took. This finding indicated an internal locus of control among the respondents.

This finding supports the finding that those with an internal locus of control are much more likely to experience subjective well-being (Stocks, April & Lynton, 2012:18). The internal locus of control contributed to respondents feeling empowered and having a belief that they could manage their diabetes. The internal locus of control also accounted for the observation of respondents' eagerness to apply what they had learned. The researcher found that throughout the study respondents felt motivated to apply what they learned from both the diabetes clinic and the lifestyle intervention programme.

This eagerness to apply learning to their own lives was attributed not only to their internal locus of control, but also to the therapeutic effects of groups, as discussed in chapter 3. Out of all the therapeutic factors, the researcher felt that respondents benefitted most notably from knowing that they were not alone and from the sharing of information through discussion (Oliveira et al., 2008:434).

From the biopsychosocial perspective, this showed that the respondents felt confident in their own ability not only to affect their health, but also to affect the biological components of their diabetes.

- **Goal and goal setting regarding diabetes**

The questionnaire indicated that most respondents knew what a goal was, how to set their own goals and set goals regarding the management of their diabetes. This was true for both the experimental and control group.

This finding showed that the respondents were, contrary to the researcher's initial observations, not passive recipients of care. The respondents were able to set goals and track their progress. They did so in order to better manage their diabetes. What the respondents did lack, however, was accurate and easy to understand information. Without access to this information, goals could be set which would be detrimental to diabetes management.

The lifestyle intervention played an important role here, as it equipped respondents with accurate, simple and practical information. Being better informed meant that respondents could set goals that would help them reach their goals more effectively and efficiently than before.

- **Feelings about diabetes**

The majority of the respondents indicated they felt bad or neutral about being diagnosed or living with diabetes (42.86% of the experimental group and 38.46% of the control group). Only 15.38% of respondents in the control group indicated feeling good about their diabetes. Not one of the respondents in the experimental group indicated feeling good about their diabetes.

The researcher found that those who reported feeling bad about the diabetes often did so due to the pain of treatment. This was the pain from regular testing and injections. Many respondents complained that testing was difficult as they would often receive insufficient testing strips to test often enough. Respondents also complained about injections being painful at times.

The researcher understood reported treatment pain by looking at the theory of planned behaviour. The theory of planned behaviour, which evolved from the theory of reasoned action, was developed to complement the theory of reasoned action; it states that intention to

act can be used to predict behaviour and that intention can be determined by looking at: the evaluation of the behaviour and the expected outcome, subjective norms and perceived behavioural control (Morris et al., 2012:5; Jasaragic, 2014).

The behaviour of injecting and testing was associated with the outcome of pain. Respondents, however, did continue to do both testing and injecting, as these also held both the outcome of controlled glucose and approval for self-care from family members and medical staff. The factor that resulted in most respondents continuing with testing and injecting was that they felt it was within their control. They felt they could test and inject autonomously and experienced a sense of mastery.

The researcher found it a matter of concern that the majority of respondents felt bad about their condition. This was because their diabetes could not be cured. The researcher identified a definite need for support groups for Type 1 diabetic patients within Kalafong Hospital. Support groups would allow patients to identify their feelings, examine the reasons behind them, share their experiences and learn to accept their diagnosis.

- **Reported sources of support**

This finding speaks directly to the social component of the biopsychosocial perspective. The respondents indicated that support came predominantly from family (78.57% of the experimental group and 100% of the control group). Only 21.43% of respondents in the experimental group indicated that they had a partner on whom they could rely for support. None of the respondents felt that they could talk to friends or colleagues for support.

This supports literature discussed in chapter 2. The mental and social impact of diabetes on the individual easily results in the individual feeling different from so-called “normal” people and the individual often fears isolation and stigmatisation (Young & Unachukwu, 2012:5-6).

The researcher observed that it was easy for the respondents to rely on family, as family were already close to them and they felt a strong attachment to them. Respondents, however, despite being attached to their friends and colleagues, did not discuss their condition with them at all.

The main barrier to discussion or disclosure to friends and colleagues was fear, fear of isolation and stigmatisation as discussed previously. This finding was concerning as it showed that respondents did not have support networks outside of family.

### 3.6.3 Blood results

Blood results were taken from each participant before intervention and for most respondents after intervention. In total, five respondents became unreachable after the study, resulting in their post-test blood test not being completed.

The table below shows the findings of the HbA1c blood test. The results were analysed using the T-test. The T-test was used here as Fisher's exact test cannot be used to determine the p-value of the HbA1c blood-test.

**Table 3.11: Statistics: Blood results of the study**

Group Statistics				
	Group	N	Mean	Std. Deviation
Pre-Test	Experimental	17	10.0294	2.09337
	Control	21	9.1143	2.17262
Post-Test	Experimental	15	8.98	2.17131
	Control	18	9.3611	2.00884

From the results, one can see that there was some change in the pre-intervention HbA1c and the post-intervention HbA1c. The change in HbA1c within the experimental group was from a means of 10.02% to 8.98% (a decrease of 1.04) and the change in HbA1c within the control group was from 9.11% to 9.36% (an increase of 0.25). This means that the experimental group showed an improvement of 1.04% whilst the control group worsened by 0.25%.

Standard deviation also remained quite constant. The standard deviation went from 2.1 to 2.2 within the experimental group and from 2.2 to 2 for the control group. This shows that the HbA1c changes were uniform between the groups, both in pre-test and post-test.

**Table 3.12: HbA1c T-test results (Experimental group compared to control group)**

		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
Pre-Test	Equal variances assumed	0.198	0.91513	0.69746
	Equal variances not assumed	0.196	0.91513	0.69466
Post-Test	Equal variances assumed	0.605	-0.38111	0.7285
	Equal variances not assumed	0.607	-0.38111	0.73382

The preceding table shows the T-test results of the HbA1c of the experimental group compared to the control group. The main discovery from this test was that none of the p-values were under 0.05. This meant that the intervention did not significantly affect the HbA1c of the respondents.

The change in HbA1c discussed here is illustrated in the following figure. As mentioned, there is a change in the HbA1c of the experimental group as compared to the control group.





**Figure 3.4: Bar and whisker graph illustrating change in HbA1c for both intervention and control group**

This figure shows the change in HbA1c between the pre-test and post-test of both the experimental and control group. The figure shows the mean, upper 75% and lower 25% using the bar and whisker graph.

Despite the visually visible change in HbA1c, the p-value change between the groups remains 0.6. This is far above the 0.05 required for significance. This meant that the study was unable to significantly affect the HbA1c of the respondents through use of lifestyle intervention within a six-week period.

### ***3.6.4 Discussion of findings from the biopsychosocial perspective***

The biopsychosocial model considers an individual holistically by examining the biological, psychological and social effect a disease or condition has on an individual. Within this study all of the respondents shared the same biological condition (excluding complications) of Type 1 diabetes.

From the findings above, with both the non-parametric and blood results, it is clear that Type 1 diabetes did not affect each respondent in the same way. Despite the individual manner in which each respondent was affected, the researcher could identify overlaps, between the

respondents, of how individuals were affected. Following is the discussion on the biopsychosocial impact of the Type 1 diabetes, according to the preceding findings.

Patients were all aware of the biological effects diabetes had on their bodies. All could give examples of how diabetes directly affected them. The psychological impact differed among the respondents. Some respondents could manage their condition and were satisfied with the overall process of management, whereas others were overwhelmed by the management, perceiving it as taking up all of their time and energy.

Socially, respondents also relied solely on family and partners for support. This meant that for most respondents there was a strong psychological barrier, a fear of stigma, resulting in them not disclosing their condition to those around them (friends and colleagues). In so doing, most of the respondents cut off potential sources of support and isolated themselves. By isolating themselves, these respondents placed further psychological strain on themselves as they faced their diabetes “alone”.

As a whole the findings showed that the intervention did not significantly affect the biological, psychological or social components of the respondents. This means that the respondents, within the experimental group, when considered holistically, did not experience any significant change, despite being exposed to lifestyle intervention.

### 3.7 Summary

This chapter looked at the methods used to collect data. The ethical considerations of collecting this data were also discussed. A large part of the chapter then looked at the quantitative findings, all of which were discussed, using tables and figures.

Conclusions and recommendations follow in chapter 4.

## Chapter 4: Summary, conclusions and recommendations

### 4.1 Introduction

The final chapter summarises the research and looks at whether the research goals and objectives were achieved and, if so, the extent to which the research goals were achieved. This chapter answers the problem statement and hypothesis, and provides the conclusions drawn from the themes and the blood results.

The chapter concludes by providing recommendations for practice and future research based on the findings of this study.

### 4.2 Summary

Following the findings and discussion in chapter 3, a summary of the results of the research follows. This section draws to a close the research report and provides a concise discussion of what was set out to be accomplished, what was found and where to go from here.

#### 4.2.1 Goal

The goal of the study was to determine: **The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital**. The goal was met by means of achieving the following objectives.

#### 4.2.2 Objectives

- To conceptualise diabetes as a phenomenon and its impact on patients
- To do a baseline and post-intervention measurement of both the motivation and average blood glucose (HbA1c) of diabetic patients at the start of the lifestyle intervention with both the experimental and the control group. The experimental group will undergo the lifestyle intervention programme whilst the control group will receive only standard medical care.
- To describe the contents of the lifestyle intervention programme

- To implement six group education sessions to educate Type 1 patients on diabetes mellitus
- To determine the impact, if any, of the lifestyle intervention on the motivation of diabetic patients within Kalafong Hospital
- To compare and describe the impact of the lifestyle intervention on the motivation of Type 1 diabetic patients within Kalafong Hospital against a control group, as well as against the results of the same intervention held with Type 2 diabetic patients
- To recommend improvements to this programme.

Each objective will be discussed and explained as to how it was met through this study.

#### ***4.2.3 Objective 1: To conceptualise diabetes as a phenomenon and its impact on patients***

The first objective was achieved through the literature review provided in chapter 2. Chapter 2 provided the reader with context. Chapter 2 provided both the key medical and non-medical terms needed to best understand the research.

Diabetes was examined by looking at its history, types of diabetes, complications and the features of both Type 1 and Type 2 diabetes. Special attention was also given to the effect that diabetes has on the individual and those around him/her. The impact of diabetes on the patient was considered by looking at the patient through the biopsychosocial perspective. The researcher examined the effect of diabetes by looking at its effect biologically, mentally, socially and also the effect on family and society.

The researcher showed the biological, psychological and social effects of diabetes on those affected. The research also showed how the respondents were using their psychological strengths and social support in order to manage their diabetes.

*4.2.4 Objective 2: To do a baseline and post-intervention measurement of both the motivation and average blood glucose (HbA1c) of diabetic patients at the start of the lifestyle intervention with both the experimental and the control group*

The second objective was partially achieved. As presented in chapter 3 under the discussion of research findings, the objective was achieved only partially, as the initial scale that would allow for measurement of motivation proved unfeasible. The result was that the researcher utilised a modified scale combined with a questionnaire, (i.e. the modified questionnaire), instead of the standardised scale. Despite the change to a modified questionnaire, the researcher successfully established a baseline and post-intervention measurement of the respondents' HbA1c.

The research found that lifestyle intervention allowed the respondents to more clearly express their needs and concerns about their own diabetes. The lifestyle intervention also had a positive effect, although not significant, on respondents' HbA1c. Further study is required to establish whether a prolonged intervention would have a significant effect on the respondents' HbA1c.

*4.2.5 Objective 3: To describe the contents of the lifestyle intervention programme*

The third objective was also achieved through the literature review which described lifestyle intervention, its role in the management of diabetes and the role of diet and exercise in lifestyle intervention. Lifestyle intervention aims to affect holistic change in behaviour related to diet and exercise. The importance of motivation was emphasised in the study as a requirement for the formation of lasting habits and behaviour.

*4.2.6 Objective 4: To implement six group-education sessions to educate Type 1 patients on diabetes mellitus*

The fourth objective was successfully achieved. The six sessions planned were successfully concluded at Kalafong Hospital. These educational sessions were referred to as the Lifestyle Intervention Project and ran throughout 2015. The sessions were presented at Kalafong

Hospital. In order to remove possible barriers to the attendance of the sessions, the transport costs of respondents were refunded.

#### *4.2.7 Objective 5: To determine the impact, if any, of the lifestyle intervention on the motivation of diabetic patients within Kalafong Hospital*

The fifth objective was successfully completed. In summary, the research found that the six-week lifestyle intervention did not produce a significant change in the HbA1c or motivation of the respondents. Respondents showed improvement compared to the control group, but the study could not show that the change was either significant or solely due to the lifestyle intervention.

As explained, the researcher was unable to utilise the standardised scale planned due to unexpected difficulties in respondents understanding the scale. As the scale was not used, motivation was assessed through a modified questionnaire (consisting of a modified scale and a questionnaire) and blood tests. With no significant changes in responses to the modified questionnaire or blood test, the research shows that the lifestyle intervention ultimately did not have an impact on the motivation of diabetic patients within Kalafong Hospital. Even from the biopsychosocial perspective, the intervention failed to achieve any significant change.

#### *4.2.8 Objective 6: To compare and describe the impact of the lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital against a control group as well as against the results of the same intervention held with Type 2 diabetic patients*

The sixth objective was successfully achieved and both the Type 1 and Type 2 study had a similar outcome. Both the Type 1 and Type 2 patients showed insignificant change in HbA1c and motivation, as measured through the modified scale and questionnaire. HbA1c did decrease but the study could not show a significant change. There were no significant changes in responses within the pre- and post-test modified scale and questionnaire.

The researcher observed that the health literacy of the respondents in both studies improved. Respondents were much more literate in reporting their diabetes concerns. Respondents became aware of the various aspects of diabetes such as different ways to improve their own diabetes management. Respondents also felt more encouraged to discuss their diabetes with others.

Despite this increase in health literacy, the lifestyle intervention had no significant impact on participant motivation (for both Type 1 and Type 2 patients).

#### *4.2.9 Objective 7: To recommend improvements to this programme*

The seventh objective was successfully achieved. The recommendations to the improvement of the programme were made to the Department of Internal Medicine and are discussed further under recommendations.

#### *4.2.10 Goal of the study*

The overall goal of the study was to determine the impact of the lifestyle intervention on the motivation of Type 1 diabetic patient's within Kalafong Hospital. The goal was accomplished as follows:

In order to understand diabetes as a condition, a literature review was conducted. In the literature review, key terms were provided to familiarise the reader with these terms. A discussion of the biopsychosocial perspective followed as this theoretical framework was the lens through which the researcher examined both the research problem and the research findings. A lengthy discussion on diabetes followed, in which the history of diabetes, the types and complications thereof were discussed. This was the foundation from which the researcher focused the reader towards the study at hand by contextualising the study. This was done by examining diabetes treatment in South Africa, the South African healthcare system and finally treatment of diabetes within Kalafong Hospital.

With the reader aware of both the condition and the context, the researcher discussed lifestyle intervention, motivation, group work and the role of a social worker within a hospital. All of this provided the reader with insight into the choice of research methodology as also discussed in chapter 3.

The study accomplished the goal of determining the impact of lifestyle intervention on the motivation of Type 1 diabetic patients within Kalafong Hospital in chapter 3, through the research findings. These findings showed how, despite some change, the lifestyle intervention did not impact on the motivation of Type 1 diabetic patients within Kalafong Hospital.

#### *4.2.11 Problem statement*

The problem statement: “Type 1 diabetic patients exposed to lifestyle intervention should experience a sustained increased motivation to adhere to a proper diet and exercise routine that continues even after the termination of the lifestyle intervention” was resolved, with the researcher finding that the lifestyle intervention did not produce increased motivation to adhere to a proper diet and exercise routine.

#### *4.2.12 Hypothesis*

The study also had the following hypothesis: **When exposed to lifestyle intervention, Type 1 diabetic patients will show a reduced HbA1c which will be sustained over a three-month period.** The hypothesis was disproved as the change in HbA1c was insignificant.

### *4.3 Key findings*

The researcher found that the findings were similar across both the experimental and control group. As such they will not be discussed separately. Instead, all the key findings from the questionnaire and blood results are discussed together.

- **Management of diabetes**



The research found that the respondents managed their diabetes with treatment and exercise. Only a minority of the respondents mentioned using diet to assist in the management of their diabetes. This was surprising as all diabetic patients at Kalafong Hospital see the dieticians at least once.

It could be that respondents considered it as a given and did not mention it on the questionnaire. Another reason could be that for many of the respondents, diet was not something that they could easily change. They might have felt a lack of control over diet due to socioeconomic barriers.

- **Time spent managing diabetes**

The study found that the majority of respondents spent over one hour per day in order to manage their diabetes. The study, however, did find that among those who were unhappy, most indicated they spent 24 hours daily on management of their diabetes.

These respondents were identified as being at high risk of burnout. For this reason, support groups were identified as a useful intervention to assist patients in future.

- **Factors or activities causing unhappiness**

The majority of respondents were satisfied with the activities associated with managing their diabetes.

- **Satisfaction with the amount of time it takes to manage diabetes**

The majority of respondents were satisfied with the amount of time it took to manage their diabetes.

- **Perceived self-efficacy**

The research found that respondents were aware that they could influence their diabetes according to the decisions they make and actions they take. Respondents showed an internal locus of control and subjective well-being.

There was also an eagerness to apply and share what was learned within the lifestyle experimental groups. This eagerness to apply and share what was learned was attributed to both the internal locus and the therapeutic effects of groups.

- **Goal and goal setting regarding diabetes**

The study found that most respondents knew what a goal was, how to set goals and to set personal goals regarding the management of their diabetes. These findings showed that unlike initially thought, respondents were not passive recipients of healthcare. Instead, respondents were active and simply lacked accurate and practical information that would allow them to properly manage their condition.

Lifestyle intervention played an important role here, as the respondents were exposed to simple, accurate and practical information that empowered them to reach their goals more effectively and efficiently.

- **Feelings about diabetes**

The majority of the respondents indicated they felt bad about being diagnosed as a Type 1 diabetic patient. Respondents attributed their feelings about their condition to the pain associated with the management thereof. Respondents complained of the pain of regular testing and injecting.

The theory of planned behaviour was used to illustrate the conflict between the pain of testing and injecting and the reward of approval and controlled glucose. The tipping factor towards continued treatment was identified as the sense of mastery and autonomy.

- **Reported sources of support**

The study found that respondents easily relied on family and siblings for support. None of the respondents, however, relied on friends or colleagues. The reason for reliance on family, but not those outside of the household, was attributed to the fear of isolation and fear of stigmatisation.

### 4.3.2 Blood results

As mentioned in chapter 3, the blood results revealed the following:

- There was a change in both groups.
- The experimental group's HbA1c changed from a mean of 10.02% to 8.98%. This means that there was a mean improvement of 1.04%.
- The control group's HbA1c changed from a mean of 9.11% to 9.36%. This means their results worsened by 0.25%.
- There was a p-value change of 0.6 in the post-test results. This is above the 0.05 level and thus indicated there was an insignificant change.

The blood results show that the lifestyle intervention did not impact on the motivation of Type 1 diabetic patients at Kalafong Hospital.

The blood test HbA1c levels, however, did change slightly. It is not possible to say with confidence if the improvement seen in the HbA1c of the experimental group was due to the intervention or other variables. In order to clarify this, further research and investigation are required.

In conclusion, the researcher found that the lifestyle intervention failed to significantly impact on the motivation of Type 1 diabetic patients at Kalafong Hospital. The study did however have some positive outcomes such as increased health literacy among respondents and increased eagerness to apply and share knowledge.

## 4.4 Conclusions

In conclusion, the researcher learned that lifestyle intervention as presented throughout this research was ineffective at impacting motivation. The study did however provide some interesting findings.

- The cornerstones of treatment were well entrenched within the respondents.

- Many respondents were at risk of burnout due to spending too much time managing their condition.
- Despite the challenges, most were content about the time and activities required to manage their diabetes.
- Most respondents showed an internal locus of control regarding their perceived ability to influence their own well-being.
- Respondents also understood goals and how to set them.
- The study found that most respondents felt bad about having diabetes and relied almost solely on family for their support. Respondents didn't turn to friends and colleagues for support, due to their own perceptions and fears.
- Lifestyle intervention might not change the motivation of patients, but it provided a stepping stone for future efforts.
- From the biopsychosocial perspective, the intervention did not significantly impact on either the biological, psychological or social aspects of the respondents.

## 4.5 Recommendations

Below are the recommendations that arose from the research. These recommendations are not exhaustive. Instead, the recommendations below serve as a starting point to aid in the planning of future projects, research and interventions.

### *4.5.1 Recommendations from empirical findings*

The researcher recommends the following.

- The researcher recommends that every patient be educated on the various options available to manage their diabetes. This is to allow each patient to be able to exercise choice over the management of their condition.
- The researcher recommends that support groups be held at all government hospitals so that patients will be able to see that they are not alone. This will also help patients to learn about the challenges faced by others and how they can overcome these challenges.

#### *4.5.2 Recommendations for practice*

Although the study found lifestyle intervention as described in this study to be an ineffective means of affecting the motivation of patients, group work still holds promise. The recommendations for practice are:

- Inclusion of educational groups should be used more frequently within social work.
- Efforts should be made towards assessing and improving health literacy of patients. This will not only benefit their own healthcare management, but will also empower them to educate others.
- Social work should adopt a more academic approach to patient care, allowing for easier research and effective sharing of knowledge.

#### *4.5.3 Recommendations for future research*

From this study the researcher can recommend that further research be done in the following areas:

- Research should be done to assess the health literacy and actual literacy of patients within government hospitals.
- Further research should be done into the benefits of lifestyle intervention with Type 1 diabetic patients.
- Lifestyle intervention should be researched using a similar method as in this study, but with a much larger representative sample and over a longer period of time.
- Research should be conducted to determine why patients rely on family for support but not friends or colleagues.

### **4.6 Closing statements**

In closing, the researcher can say that there is a definite place for both group work and lifestyle intervention within the South African healthcare context. Despite the research showing that the intervention was unable to affect the respondents' motivation significantly, the researcher did observe an impact regarding health literacy and an eagerness to apply what had been learned. Future research could indicate how the benefits observed can be applied on a larger scale.

The findings of the study also benefit the knowledge base of the social work profession, as it conducted lifestyle intervention using group work. The study illustrated that the approach can be effective for influencing variables other than motivation.

There is a scarcity of academic knowledge about social work within healthcare in the South African context. This scarcity will directly affect future generations of social workers as they encounter similar problems. The researcher encourages other social workers within healthcare settings to conduct research within their organisations and to share their findings, so that this scarcity of local knowledge can be fulfilled.

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## Appendix A: Ethics approval – Faculty of Humanities



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Humanities  
Research Ethics Committee

28 February 2014

Dear Prof Lombard

**Project:** The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital  
**Researcher:** DG Vertue  
**Department:** Social Work and Criminology  
**Reference number:** 04420209

Thank you for your response to the Committee's correspondence of 11 December 2014

I have pleasure in informing you that the Research Ethics Committee formally **approved** the above study at an *ad hoc* meeting held on 24 February 2014. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should your actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely

**Prof. Karen Harris**  
**Acting Chair: Research Ethics Committee**  
**Faculty of Humanities**  
**UNIVERSITY OF PRETORIA**  
**e-mail: karen.harris@up.ac.za**

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Research Ethics Committee Members: Dr L Blokland; Prof M-H Coetzee; Dr JEH Grobler; Prof KL Harris (Acting Chair); Ms H Klopper; Dr C Panebianco-Warrens; Dr C Puttergill; Prof GM Spies; Dr Y Spies; Prof E Taljard ; Dr FG Wolmarans, Dr P Wood

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## Appendix B: Ethics approval – Faculty of Health Sciences

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 20 Oct 2016.

\* **IRB** 0000 2235 IORG0001762 Approved dd 13/04/2011 and Expires 13/04/2014.



UNIVERSITEIT VAN PRETORIA  
 UNIVERSITY OF PRETORIA  
 YUNIBESITHI YA PRETORIA

Denklers • Leading Minds • Dikgopolo tsa Dihlateli  
 Faculty of Health Sciences Research Ethics Committee  
 Fakulteit Gesondheidswetenskappe Navorsingsetiekomitee

DATE: 6/09/2012

NUMBER	167/2012
TITLE OF THE PROTOCOL	Randomized controlled study to evaluate a six week peer support-group education programme, added to standard care, compared to standard care alone in patients with <b>type I Diabetes Mellitus</b>
PRINCIPAL INVESTIGATOR	Name & Surname: Dr L Schoeman Dept: Internal Medicine, Kalafong Road, Kalafong Hospital. University of Pretoria. Cell: 0829044947 E-Mail: lizette.schoeman@gmail.com / lizette@kalafong.up.ac.za
SUB INVESTIGATOR	
STUDY COORDINATOR	None
SUPERVISOR (ONLY when STUDENTS)	Not Applicable
STUDY DEGREE	None.
SPONSOR COMPANY	None.
MEETING DATE	5/09/2012

The Protocol and Informed Consent Document were approved on 5/09/2012 by a properly constituted meeting of the Ethics Committee subject to the following conditions:

1. The approval is valid for 2 years period [till the end of December 2014], and
2. The approval is conditional on the receipt of 6 monthly written Progress Reports, and
3. The approval is conditional on the research being conducted as stipulated by the details of the documents submitted to and approved by the Committee. In the event that a need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

*Members of the Research Ethics Committee:*

Prof M J Bester	(female) BSc (Chemistry and Biochemistry); BSc (Hons) (Biochemistry); MSc (Biochemistry); PhD (Medical Biochemistry)
Prof R Delpoit	(female) BA et Scien, B Curatiosis (Hons) (Intensive care Nursing), M Sc (Physiology), PhD (Medicine), M Ed Computer Assisted Education
Dr NK Likibi	MBB HM – Representing Gauteng Department of Health) MPH
Dr MP Mathebula	(female) Deputy CEO: Steve Biko Academic Hospital; MBChB, PDM, HM
Prof A Nienaber	(female) BA (Hons) (Wits); LLB; LL.M; LL.D (UP); PhD; Dipl. Datametrics (UNISA) – Legal advisor
Mrs MC Nzeku	(female) BSc (NUL); MSc (Biochem) (UCL, UK) – Community representative
Prof L M Ntsho	MbChB (Natal) FCS (SA)
Snr Sr J Phatoli	(female) BCur (Eet.A); BTec (Oncology Nursing Science) – Nursing representative
Dr R Reynders	MBChB (Pret), FCPaed (CMSA) MRCPCH (Lon) Cert Med. Onc (CMSA)
Dr T Rossouw	(female) MBChB (cum laude); M.Phil (Applied Ethics) (cum laude), MPH (Biostatistics and Epidemiology (cum laude), D.Phil

Dr L Schoeman (female) B.Pharm, BA(Hons)(Psych), PhD – Chairperson: Subcommittee of students' research  
Mr Y Sikweyiya MPH; SARETI Fellowship in Research Ethics, SARETI ERCTP;  
BSc(Health Promotion)Postgraduate Dip (Health Promotion) – Community representative  
Dr R Sommers (female) MBChB; MMed(Int); MPharmMed – Deputy Chairperson  
Prof TJP Swart BChD, MSc (Odont), MChD (Oral Path), PGCHE – School of Dentistry representative  
Prof C W van Staden MBChB; MMed (Psych); MD; FCPsych; FTCL; UPLM - Chairperson

Please note that the Principle Investigator did not evaluate or partake in the final approval of this study and she did not make a decision or participate in the conclusion reached by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria.



**DR R SOMMERS**; MBChB; MMed(Int); MPharmMed.  
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

◆Tel:012-3541330      ◆Fax:012-3541367 / 0866515924      ◆E-Mail: [manda@med.up.ac.za](mailto:manda@med.up.ac.za)  
◆Web: [www.healthethics-up.co.za](http://www.healthethics-up.co.za)      ◆H W Snyman Bld (South) Level 2-34      ◆Private Bag x 323, Arcadia, Pta, S.A., 0007

## Appendix C: Permission letter - Kalafong hospital


KALAFONG HOSPITAL  
PRIVATE BAG X396  
PRETORIA  
0001  
23 DECEMBER 2013

ENQUIRIES : DR D. UBOMBA  
TEL : 012 318 6503  
FAX : 012 373 9021

**RE: PERMISSION TO CONDUCT RESEARCH**

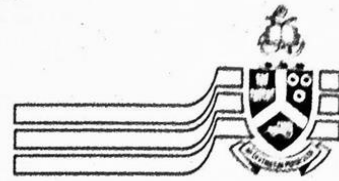
**Title: The Impact of Lifestyle Intervention on the Motivation of Type 1 Diabetic Patients at Kalafong Hospital.**

Permission is hereby given for the research to be conducted at Kalafong Hospital.

  
DR D. UBOMBA  
MEDICAL MANAGER  
KALAFONG HOSPITAL

GAUTENG PROVINCIAL GOVERNMENT  
KALAFONG HOSPITAL / HOSPITAAL  
23 DEC 2013  
PRIVATE BAG / PRIVAATSAK X396 PRETORIA 0001  
SUPERINTENDENT'S OFFICE

## Appendix D: Letter of permission – Dept. of Internal Medicine, Faculty of Health Sciences



University of Pretoria

Pretoria 0002 Republic of South Africa <http://www.up.ac.za>

Faculty of Health Sciences  
Department Internal Medicine  
Private Bag X396  
PRETORIA 0001

30/10/2012

To whom it concern

**Re: Dominic Vertue**

The above mentioned person is currently an enrolled postgraduate student at the University of Pretoria and an employee at Kalafong hospital. He has arranged with me to participate in a research project in which he will contribute significantly. The data generated from his contribution will be available to him for use for degree purposes. His contribution will be part of two larger studies titled: "A randomized controlled study to evaluate a six week peer support-group lifestyle education programme, added to standard care, compared to standard care alone in patients with Type 1 diabetes mellitus" and "A randomized controlled study to evaluate a six week peer support-group lifestyle education programme, added to standard care, compared to standard care alone in patients with Type 2 diabetes mellitus". He will approach the patients of the mentioned studies for his project "Impact of the lifestyle intervention on the motivation of diabetic patients within Kalafong hospital". These two studies will commence end of January 2013. We are privileged to have him on the team involved in these studies.

A handwritten signature in black ink, appearing to read 'DG van Zyl'.

Prof DG van Zyl  
Department Internal Medicine  
Kalafong Hospital  
Tel: 012 373 1075  
Cel: 082 823 2056

## Appendix E: Letter of informed consent



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Faculty of Humanities  
Department of Social Work and Criminology  
27 March 2015

### PARTICIPANT'S INFORMATION LEAFLET AND INFORMED CONSENT

The impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital

#### Dear participant,

You are invited to volunteer to be part of a study. I am part of a team of health care professionals working in the Diabetes Clinic at Kalafong Hospital. I want to find out if the lifestyle intervention program is able to change your motivation (helps to make it easier to live with diabetes). I will look at how the program is changing your motivation by using a blood test, a questionnaire and a scale (another questionnaire).

This document will help you to decide if you want to take part in this study or not. Before you agree, you should fully understand what is involved. If you do not understand the information or have any other questions, please ask for further information. You should not agree to take part unless you are completely happy about what we expect of you.

#### Reason for the study

The reason why we do this study is to find out if patients, with type 1 diabetes, will be more motivated and empowered to control their diabetes if they are part of a lifestyle intervention.

If you are willing to be part of the study, we will divide you in two groups. We will do this randomly – it means it is like flipping a coin – we will not decide who will be in which group but the computer will. You will have an equal chance of being in each group.

The first group will be the research group – and you will go through a six week small group program that will start in March 2015. We will meet for six sessions. The other group will be the control group and will go through the six sessions after the research group. We will meet for six sessions (times and dates will be provided before you start).

#### What will you be required to do?

You will have to commit yourself to come for the six sessions and participate in the small group program. You will also have to complete the questionnaire.

Building and Room no  
University of Pretoria  
Private bag X20, Hatfield 0028  
Republic of South Africa

Tel Number: +27 (0)12 420 2410  
Fax Number: +27 (0)12 420 2093

Email address  
charlene.carbonatto@up.ac.za

We will draw blood on the first day to measure your HbAc1 and again after 12 weeks (this will be instead of the blood that would have been drawn at your clinic visit).

On the first day and at the end of 12 weeks we will ask you to complete the following questionnaire:

- A diabetes questionnaire consisting of 21 general questions.  
Of this some will be closed questions and some open ended questions.

### **Confidentiality**

Your name will be used on the questionnaires so that we can match them with the follow-up questionnaires. We will keep your name secret when we report the results of the study. When we report about the study, we will only use numbers and not names. The questionnaires will be kept in a safe place.

### **Participation**

You can refuse to participate or stop participating at any time if you feel uncomfortable. Should any question make you feel uncomfortable, you will not have to answer that question. Your participation in this study will not affect your treatment in the clinic in any way.

We hope that you will benefit from the study and also hope that the information that you provide and experience we gain, will help us to assist future patients better.

Your participation in this study is voluntary, this means you are free to decide if you want to participate or not. You can refuse to participate or stop at any time without giving any reason.

You will not be paid for your participation in this study but we will cover your transport costs.

If you are sure that you understand what the study is about, and have asked all the questions you wanted to ask regarding the study, and if you are willing to participate, you can sign this form.

Thank you.

Department of Social Work  
University of Pretoria Pretoria  
0002 South Africa

Tel Number: +27 (0)12 420 2410  
Fax Number: +27 (0)12 420 2093

Email address  
charlene.carbonatto@up.ac.za

### **PARTICIPANT'S INFORMATION LEAFLET AND INFORMED CONSENT**

I hereby agree to participate in the "randomized controlled study to evaluate a six week peer support-group coping education programme, added to standard care, compared to standard care alone in patients with Type 1 diabetes mellitus" which includes the "impact of lifestyle intervention on the motivation of Type 1 diabetic patients at Kalafong Hospital" study.

Name of participant

Date

Signature of participant

Name of researcher

Date

Signature of researcher



## Appendix F: Modified questionnaire

### Questionnaire

Details (This will be confidential)

NAME: \_\_\_\_\_ FILE NUMBER: \_\_\_\_\_

1.3. Are you satisfied/happy with the amount of time it takes Yes No

2. When you are sick:

- You feel it's because of something I did wrong Yes No
- You feel it is because of poor diet Yes No
- You feel it is because of a lack of exercise Yes No
- You feel it is because of my own carelessness Yes No
- Other Yes No

3. I know what a goal is Yes No

3.1. I know how to set my own goals Yes No

3.2. I set goals to manage my diabetes? Yes No

3.3. How do you achieve your goals? (Plan, daily tasks, etc.)

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3.4. Are you having any problems reaching your goals? (What are the problems?)

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What do you have to do daily to take care of my diabetes?

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How much time do you spend each day to manage or take care of your diabetes? \_\_\_\_\_Hours

Are there any of these things/activities you are unhappy about

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---

How do you solve these problems?

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How do you feel about having diabetes?

Good Neutral Bad

What do you think you can do to feel better about having diabetes (living with diabetes)?

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---

What are you doing that makes you feel that you are managing your diabetes?

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---

Do you know where to go when you need help with diabetes?  
Yes No

4.4. Who at home is there when you need to talk about problems with your diabetes?

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---

4.5. When you feel like giving up on goals and activities - who keeps you going?

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4.6. Have you, since being diagnosed, tried different (new) things to see what works for u (because one thing works someone but not necessarily you)?  
Yes No

THANK YOU FOR YOUR TIME

## Appendix G: Original scale (DES-SF)

### Diabetes Empowerment Scale – Short Form

---

Diabetes Research and Training Center, 2003. *DES-SF*. USA: University of Michigan.

**The 8 items below constitute the DES-SF. The scale is scored by averaging the scores of all completed items (Strongly Disagree =1, Strongly Agree = 5)**

In general, I believe that I:

1. ...know what part(s) of taking care of my diabetes that I am dissatisfied with.
2. ...am able to turn my diabetes goals into a workable plan.
3. ...can try out different ways of overcoming barriers to my diabetes goals.
4. ...can find ways to feel better about having diabetes.
5. ...know the positive ways I cope with diabetes-related stress.
6. ...can ask for support for having and caring for my diabetes when I need it.
7. ...know what helps me stay motivated to care for my diabetes.
8. ...know enough about myself as a person to make diabetes care choices that are right for me.

## Appendix H: Questionnaire

Name: \_\_\_\_\_ Hospital Number \_\_\_\_\_

### Diabetes Questionnaire

Please answer each of the following questions by making a X through your choice:

Example: You wish to be part of the lifestyle intervention

1. I want to change something about my diabetes (eg. Diet, medication and/or exercise)
2. I know what a goal is
3. I know how to set my own goals
4. When I have a problem I cannot solve I will try a different way of solving it
5. How do you feel about living with diabetes
6. Do you have any stress
7. Do you know how to cope well with stress
8. Do you have people in your life you can ask for help when you need it
9. Do you know what motivation is
10. Do you know how to stay motivated
11. Do you feel you need to learn more about yourself
12. Do you feel you need to learn more about diabetes
13. Do you know enough about diabetes to make good choices

Yes	No
-----	----

Yes	No	
Yes	No	
Yes	No	
Yes	No	
Good	Bad	Other
Yes	No	
Yes	No	
Yes	No	
Yes	No	
Yes	No	
Yes	No	
Yes	No	
Yes	No	

**Thank you for helping us to understand your needs better.**  
Enjoy being part of the lifestyle intervention.

## Appendix I: Lifestyle intervention programme course content

### Diabetes Lifestyle Study

Kalafong Hospital Diabetes clinic

### Type 1 Diabetes

What is type 1 diabetes?

There are a number of types of diabetes; however, only 2 types are frequently seen. The difference in type 1 and type 2 diabetes is in the way it starts.

**Type 1:** Is a disease that starts with the destruction of the cells in the pancreas (an organ behind the stomach in the abdomen) that produces insulin for your body.

**Type 2:** Starts with insulin resistance (body cells that do not want to respond appropriately to insulin) and only later the production of insulin is impaired.

Both types of diabetes result in the same thing namely; high blood glucose.

*What causes type 1 diabetes?*

The cause of type 1 diabetes is inflammation and destruction of the insulin producing cells (Beta – cells in the islets of Langerhans in the pancreas), this happens because of a process that is called an autoimmune reaction (meaning that it is caused by the body's own immune system). Why this happens is not yet clear.

*How many people have type 1 diabetes?*

It occurs in about 0.5% of the population. This means that one in every 200 people has diabetes type 1. So if you are in a school or a church with 600 pupils or members, there will be about 3 type 1 diabetic people. This is much less than that for type 2 diabetes which occurs in one of every 12 people.

*What does insulin do?*

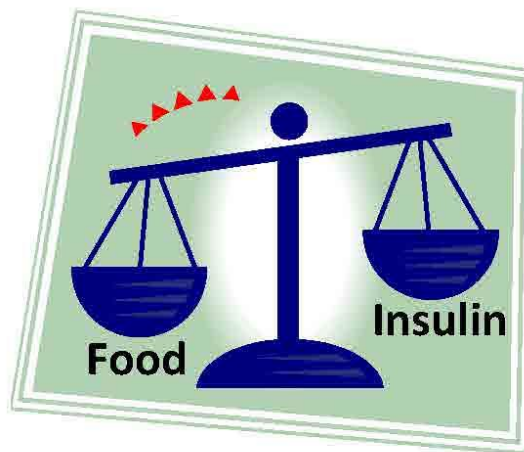
Insulin is a hormone that is needed to move glucose, absorbed from the gut into the blood, into the body cells where the energy is released to maintain body functions. If insulin is absent or too little the glucose cannot be moved out of the blood into the cells and thus remains in the blood. This then causes the high blood glucose. High blood glucose in the blood is detrimental for the body because it binds to the proteins of blood vessel wall cells. This effect is especially prominent in the blood vessels of the kidneys and in the back of the eyes, but all blood vessels are affected.

*How can diabetes type 1 be managed?*

Due to an insulin deficiency, the only way to manage it is to replace the insulin with insulin injections. In people **not** having diabetes the insulin producing cells in the pancreas 'sense' what the blood glucose level is and then automatically produce and secrete the correct amount of insulin needed to move the glucose absorbed from the gut into the body cells. In people with type 1 diabetes they need to constantly try and match the amount of insulin injected, to the amount of food eaten. If the amount of insulin injected is too little for the food eaten the glucose will be high



(hyperglycaemia or hyper), if it is too much the glucose in the blood may go too low (hypoglycaemia or hypo). The ideal is to match insulin perfectly with the amount of insulin injected and to achieve normal blood glucose.



There are a number of different types of insulin, which works for longer and shorter times which can be used to help you to control your blood glucose. However, insulin works slightly differently in every individual. Some insulins work for a short time (e.g. Humulin R, Insuman R and Actrapid) others work for a longer time (Humulin N, Insuman and Protaphane). There are also insulins that are already mixed, that is longer working insulin mixed with short acting insulin (e.g. Humulin 30/70, Insuman 30/70 and Actraphane). These insulins are mixed to contain 30% short acting and 70% longer acting.

The ideal is to get the right amount of insulin and the correct amount of longer and shorter acting insulin for you to keep your blood glucose normal constantly.

*How do I know if my blood glucose is well controlled?*

You cannot feel what your blood glucose level is, unless it is too low (hypo) and sometimes when it is too high. You can only know what your blood glucose is if you test it. For this you need a blood glucose machine (glucometer). The more times you test the better you will know what is happening with your blood glucose. If you test regularly you will also be able to adjust your insulin to what you are eating because you will know what certain foods are doing to your blood glucose and how much insulin you will need to keep your blood glucose normal.

*The best blood glucose level for Type 1 diabetic people:*

- Between 4 and 8 mmol/l before a meal
- Between 6 and 10 mmol/l two hours after a meal

The best way to inject insulin is to inject it before you eat, so that it will match the food that you will be consuming. Therefore it helps



to know how the food you will eat, will affect your blood glucose and how much insulin you will need to counteract the effect of that food to maintain a normal blood glucose.

A second way to know if your blood glucose was controlled during the previous 3 months will be to do a HbA1c test. This test is done at the diabetes clinic. However, this test tells you and your doctor how well your glucose was controlled but does not help you to control it every day. The HbA1c can be done every 3 to 6 month and the value that tells you and your doctor that your glucose is well controlled is 7%.

*What happens if glucose is poorly controlled?*

In type 1 diabetic people, if blood glucose is very poorly controlled a severe complication called Diabetic Keto-Acidosis (DKA) can occur. This can happen fast, over a day or two. It mostly happen if a diabetic patient neglects to inject insulin or when they are taking excessive amounts of calories or if some other event that puts the body under stress occurs (like an infection). A DKA is bad and can cause death if it is not treated promptly. This condition causes acid to build up in your body which destroys some of the functions of your cells. The symptoms of this are shortness of breath with deep sighing breathing, extreme thirst and passing of lots of urine. You can also become drowsy and confused. If this happens you need to go the hospital immediately for treatment.

If the blood glucose is poorly controlled for a long time (years) the blood vessels are affected. The small blood vessels are usually affected first, which leads to kidney, eye and nerve damage. The larger blood vessels are also affected and can cause you to have a stroke or heart attack at a much earlier age than people without diabetes.

*So what should I do?*

Because you are with yourself all the time and you only see the doctor or dietician once every few months, you need to learn how to manage your own blood glucose. You need to learn how to balance your food with the insulin you are injecting and your insulin to the food you are eating. We want you to be able to be your own diabetes doctor at home, school, work and when you play sport or exercise or party. You need to learn how to manage your blood glucose with every aspect of your life.



## Diabetes lifestyle study

Kalafong Hospital Diabetes Clinic

Type 1 Diabetes

Locus of control



### Session info:

This session is part of Session 2 and follows Goals and Motivation. The session aims at indicating to the participants what locus of control is and to clarify this through use of video, examples, story, discussion and an activity.

*The session should not be long. Should session run longer due to more need of clarification, questions etc. then the activity time can be reduced to 4 minutes and post-game discussion summarized. To do so participants should then only receive half the amount of beans for the activity and the post-game discussion should only encourage people to make choices that will get them to their goals (thus leaving out the part about indecision being a decision).*

Video – Short video is played that covers the following:

- Think of the last time you had a fight/argument
- Do you think you could have changed the outcome of the fight if you wanted?

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*Following the video most participants will have no clear understanding of locus of control.*

*The discussion should start with the explanation, then the story which draws the topic closer by using the participant's situation as an example and then end with an activity.*

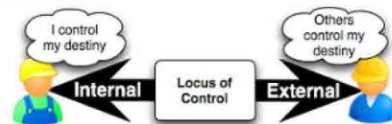
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- If you said yes then you have an internal locus of control
- If you said no then you have an external locus of control

### Discussion

Locus of control is the extent to which you believe you can control events happening to you. An easy way of looking at it is this: Your locus of control is how you look at the world. Could you control what is happening to you or not?

**Example:** You fail a test / you fail to finish a project at work on time. Those with internal locus of control blame themselves. Those with external locus of control make excuses or blame the situation, etc.



**Another example:** You get to school or work and a few people are waiting for you. You walk up and they congratulate you, taking out a newspaper and showing you that you are in the news for having done something great. The person with an internal locus of control will thank themselves and praise their efforts. But now the person with the external locus of control will say it was because of the situation (the test was too easy, etc.).



*Who do you think feels better?* The one with internal locus of control, of course. You feel great when you did something and people notice your work. You won't feel as good when you think that it only happened because of the situation.

### Story:

*For first person in the story use a more lively vocal tone and expressive/big body movements.*

*For second person use a somber tone and almost no movements.*

**A final illustration:** Two people of about the same age and same background (school, family etc.) join a project to improve their lifestyle. Both complete the program and at the end a photo is taken. Now a month later they both look at the photo.

The first one feels proud seeing the photo. He/she thinks back to the program and all the effort he/she put in. They remember how it wasn't easy but and that there were many challenges – he/she had to leave work/school and travel to the project. He/she had to give his/her time despite the family etc. at home still needing his/her time as well. But he/she overcame each of these obstacles and many others because they knew that they could change their lifestyle with the help of the program so they gave it a 100%.

The second person looks at the picture but doesn't feel much. He/she went to the sessions, but felt that other people could change their lives. They cannot change their own life. They have no control because of ABC... The person learned a bit but always had excuses of why it won't work for him/her. Excuses such as money, time and his/her context. This person even missed some of the sessions of the program – not because of an emergency but simply because they didn't feel like it. Now looking at this picture the person feels no pride and might even feel that the situation didn't work for him or it was too much work.



When we think of these two people I know which one I would rather be. I would want to be the first one that gave 100%. *Would you not also want to be this person?* The person that can look back on a photo and feel proud of all they learned and did. *The one that is in control.*

Today each of us has a choice. We can go through this program and give it a 100%. We can learn and grow and at the end feel proud of knowing we used our time well. Or we can go through the program thinking we are not in control. We can attend the sessions but not apply what we learn at home. We can keep the info for ourselves and not share with our family and friends and at the end of it all it will feel like just another thing we did.

I encourage each of you to give it a 100%. We are here for you and when you struggle, when you feel that maybe you just want to skip this session or when you feel that you don't see how something we are teaching you is going to help you at home, work and school then talk to us. You don't have to go through this program alone. You have the support of us and of your group. Help each other. When you see someone next to you is struggling, or they do not understand, then help them. Explain to them and call us to also come alongside and help out.

### Discussion

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*Have the groups discuss:*

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- *What locus of control do they think they have?*
  - *What can you do to remind yourself that you are in control and that you can make changes to your own life?*
  - *Have you made any changes before?*
  - *Share these changes*
-

### Activity: Trading beans

The activity should illustrate that each person has control. Here the game will give each person an equal chance of winning.

*Trading beans:* Each person gets 10 jellybeans. They have to trade with other people until they have only one color left (10 of the same color). Can be done with any colored object – doesn't have to be beans.

**Time:** 8 min limit to increase the rate people make choices.

**Prize:** Not yet decided.

### Post-game discussion

Again explain how during the game each person had the same start. They had to make choices to win. There would be no way for them to win without making choices.

Then explain briefly that the choices they made is exactly how they are going to be in control of their life.

*Example:* Life will go on for each of us. We cannot stop time. If we want to change anything – life, habits etc. – then we need to make choices that will get us closer and closer to what we want.

NB: You are always making choices – not deciding to do something is a choice. You decide not to. We are deciding that we will just wait to see what happens and where we end up. By not making choices towards our goals we are actually saying that the goal is not important enough for us to change anything we are doing. We are saying that what we want is not worth giving up any of our routine or comfort. We are saying that right now I am better off not going after my dream.

Because of this you can never say that a dream did not work out or you didn't reach your goal.

*You only stop reaching your goals when you decide they are no longer worth the effort of reaching them.*



## Diabetes Lifestyle Study

### Kalafong Hospital Diabetes clinic

#### Type 1 Diabetes

#### Goal Setting & Motivation



#### *Session Info:*

The session aims at helping participants learn what goals are and then assist them in setting personal goals using the SMART goals method. The session then also looks at how goals assist in keeping us motivated.

#### *Discussion*

Each day you get things done. You wake up and you get out of bed. Then at night you return to bed having done many things throughout the day. The easier way is to go through the motions without knowing or seeing our goal. This way we become demotivated, demoralized, tired, bored.

Close your eyes if you are comfortable otherwise keep them open, but try to imagine this story. You are walking with your backpack. You look ahead and see the road going as far as you can see. The sun is above you and you can feel the heat on your head and the sweat on your forehead.

You walk and walk and you feel your backpack is getting tired. Now open your eyes if they were closed.



heavier and heavier. You feel more and more

tired. What do you think you are walking towards? (*Give an something they would be walking towards*). It would be going, how far you have left to walk and what you can

example and pick two people to think of easy to keep going if you know where you're expect at your destination.

It is a lot easier to do something if you know what you will get. *Example:* Imagine that you have a new job and they tell you that you'll have to work every day Monday to Sunday from 5am to 7pm. You might think "great, this will make me a lot of money".

But would you do this work if your new boss told you: "do this work for one month and I will see how much I'm going to pay you at the end of the month". No - you don't know if you will get paid or even if the pay will be worth the time you put in.

But if he told you: "I will pay you R50 000.00" then most of us would say: "well when do I start".

That money is a goal. The goal is to get that R50 000. Your goal is the money. How do you get the money? You work for one month Monday to Sunday 5 – 7. The work is the steps you need to take to reach your goal, to get the R50 000 and the Monday to Sunday 5 – 7 is what is required.

#### *Motivation*

Before we look at ways of setting good goals ask yourself: why set goals? We set goals because without a goal we don't have motivation. Motivation is the force that drives us to act.

If we don't have a clear idea of where we are going or how far we are from reaching something, then we won't be driven. We will find it easy to give up, or even get distracted by the things around us. Goals allow us to remain motivated and keep us from using our energy on things that keep us from getting where we want to go.

**SMART GOALS:**

If we want to change our lifestyle, do better at anything or learn something we have to know what we want.

I'm going to help you today to set goals. We say that a goal must be **smart**.

**SMART** is what you can use to remember how to set a goal.

**S** is for *Simple and Specific*. We must know what we want and we need to be very clear about what we want. Example: a goal like *I want to be rich* is not simple or specific.

Let's look at it. Rich in what? It is not specific. Let's say *Rich in money*.

How rich do you want to be? R1 million, R100 000, R20?

If I ask a child they might think that having a R1000 rand will make them rich.

You need to be specific.

Also, to be specific, answer the following:



What can you do to make it happen?  
What action can you take today/this week to get closer to your goal?  
Where will you start? (Home, work, friends place...)  
What sense can you put in your goal?  
- Sight, smell, touch, taste...

*A good example will be:* I want to see that I have a R1000 in my hands by the end of the month from doing piece jobs, starting this Monday.

**M** is for *Measurable*. How will you know if you are getting any closer to your goal? Let's use the same goal and say: I want to see that I have a R1000 in my hands by the end of the month from doing piece jobs starting this Monday and making sure I get R250 each week.

See, now it is more measurable. I can simply look at how much money I made so far and see if I am reaching my R250 per week.

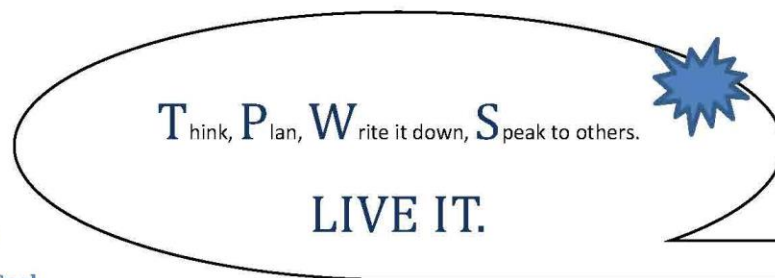
**A** is for *Attainable*. This is important – I cannot reach a goal I don't believe in. It is easy to set a goal saying by tomorrow I will have a fancy car. Do you think it can happen? Do you believe that it is possible? *No*. You need to know what will make it possible – in our example it is possible because this person has piece jobs. The piece jobs are what allow him/her to set the goal. For A (Attainable) we need to look at what we have, our support, our opportunities and anything that will help us reach our goal.

**R** is for *Realistic*. We need to be realistic. We need to keep our context in mind. A realistic goal for me is being able to run a 5km in 8 weeks. An unrealistic goal is I will run a marathon next month. It is not realistic – I have never done a race, I can't set a goal like a marathon in such a short time, not knowing what is involved. I can make the goal realistic by saying "I will run a marathon after having done 10 races starting with a 5km race that I will run in 8 weeks".

**T** is for *Time*. We have already used this in our goals, but it is good to remember that your goal needs a date. It needs an end point. Don't worry. If you set a date and fail to reach your goal all is not lost. A deadline is where you look back and say: A) Did I reach my goal? B) If not, how far/close did I come? C) How should I chance my goal to be successful?

Now, when we set goals, the best thing we can do for ourselves is to write it down. Why? Because when we write it we can easily see we had missed from the SMART method. We can easily change it. And, most importantly, we have a record. We have a place where we wrote it down, a place where I can remind myself about my goal.

Next thing is to share your written goal with friends/family. If people know you set a goal, you are less likely to just give up and throw away that piece of paper with your goal on.



### Group Discussion

#### Activity Lifestyle Goal

The activity will make the two groups compete for a prize by setting a lifestyle goal with the assistance of the facilitator.

**Goal Setting:** Each team has to work together to set one lifestyle goal (diet, fitness, Rx etc.). The teams can ask for help from the facilitator throughout and after time is passed the best goal (Most fully defined, realistic...) wins.

Time: 15 minutes.

Prize: Not yet decided.

#### Post-Game Discussion

After the game share the two goals, make amendments if needed. And encourage the participants to all set a goal for themselves. They should do this at home and give feedback the following week.



## Diabetes Lifestyle Study

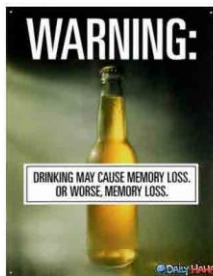
### Kalafong Hospital Diabetes clinic

#### Type 1 Diabetes

#### Alcohol use and diabetes

The general myth is that patients with diabetes are not allowed to take any alcoholic drinks this is however not true. It is important to remember though that you do need to be extremely cautious when taking any alcoholic beverages.

#### *What does alcohol do to the blood glucose?*



Alcohol ingestion even in small amounts may cause an increased risk for hypoglycaemia (low blood glucose), this effect is unpredictable and may occur up to 24 hours after the drinking. At present alcohol consumption is a major contributor to 20% of patients with hypoglycaemic brain damage in the world.

Alcohol contains sugars and is never taken as pure alcohol but is always mixed with carbohydrates as well that absorbs quickly, like in beer, wine, ciders, brandy etc. Thus, these drinks can cause the blood glucose to go up.

Very often the ingestion of alcohol makes patients with diabetes lose control, meaning they forget to take insulin and forget to test. The result is poor glucose control.

So: Alcohol can make your blood glucose go up, or down, or up then down, in any case it can be bad if not taken with great consideration.

#### *Rules for alcohol use:*

1. Alcohol can be taken in moderate amounts only if your blood glucose is controlled
2. Moderate alcohol consumption means 1 drink for **Females** and 2 drinks for **Males** per day. e.g. 120ml of dry wine; 1 tot of whisky / vodka/ gin or 1 can (330ml) of light beer.
3. You cannot pool your drinks to take the drinks of the week all at once.
4. Alcohol that contains carbohydrates may increase your blood glucose straight after drinking them. These include ciders, cocktails, sweet wines and fruity alcoholic drinks. Also other alcoholic drinks made with syrup, red bull, lemonade, fruit juice, Coke or tonic water.
5. Alcohol may never be taken on an empty stomach; it can be taken cautiously with meals only.
6. You may never become drunk or even feel the effects of alcohol, because it impairs your judgement in taking care of you diabetes.



### *Tips when taking alcohol*

1. Test your glucose regularly after you have ingested an alcoholic beverage
2. You can consume an alcoholic drink during or immediately after a meal
3. If you attend a party and drinks are served, you can dilute your drink with a sugar free cold drink for example Sprite Zero. Slowly sip the drink during the course of the evening.
4. Never drink an alcoholic drink if you are thirsty
5. If you go to a function or party, make sure you have a plan on how to manage drinking alcohol containing beverages.



### Exercise on Alcohol Consumption



You are invited to a party where you know alcohol will be served; draw up a plan on how you will take alcoholic and non-alcoholic beverages through the evening?



## GUIDELINES FOR HEALTHY EATING FOR THE WHOLE FAMILY



Eat less starch – like pap, bread, rice, chips



Eat more vegetables and fruit



Eat less red meat



Eat more beans, lentils, split peas and  
tinned fish



Use less full-cream dairy



Use low-fat and fat-free dairy like yoghurt

Eat less fat – remove fat from meat

Remove skin from chicken

Avoid fatty meat like sausage



Use olive or canola oil sparingly for cooking

Use lean meat



Use salt sparingly – polony, sausages, viennas ,

Tinned food, packets and bottles.



Use pure spices, herbs and vinegar to

improve the taste of food



Use alcohol carefully



Drink tea, coffee and diet cold drinks





**GUIDELINES FOR HEALTHY EATING FOR THE WHOLE FAMILY**



<p>Eat less starch - like pap, bread, rice, chips</p> 	<p>Eat more fruit &amp; vegetables</p> 
<p>Eat less red meat</p> 	<p>Use beans, lentils and tinned fish</p> 
<p>Use less full-cream dairy</p> 	<p>Use low-fat or fat-free milk &amp; yoghurt</p>
<p>Eat less fat- remove fat from Meat, skin from chicken &amp; avoid fatty meats like polony</p> 	<p>Use lean meat, Use olive or canola oil sparingly for cooking</p> 
<p>Use salt sparingly - tins, packets, bottles, processed food</p> 	<p>Use pure spices, herbs and vinegar</p> 
<p>Use alcohol carefully</p> 	<p>Drink water, tea, coffee &amp; diet drinks</p> 

## Diabetes lifestyle study

### Kalafong Hospital Diabetes clinic

### Type 1 Diabetes

### Sick day management



**You should always have a plan of what to do when you are not feeling well or sick.**

**Always have a card in your pocket stating that you have diabetes on you, for in case you are unconscious and cannot communicate with others.**

Just like people without diabetes sometimes get sick, so do people with diabetes. Everybody sometimes gets a bout of flu, sore throat or diarrhoea etc. This is no reason for panic, it happens to everybody. During infections such as flu your body responds in a certain way to heal itself, which includes the release of stress hormones like Cortisol and Adrenalin. These hormones are the same ones that are released before you write an examination or running a race or after you had a big fright. In patients with diabetes these hormones may cause your blood glucose to go up. It is important to manage this increased blood glucose because if it is not addressed it may result in one of the most serious complications in type 1 diabetes patients namely DKA (diabetic keto-acidosis), which is life threatening and should be managed in hospital.

#### *So what to do if you are feeling sick?*

1. Continue to take your insulin (you will more likely require more insulin than your usual insulin dose to maintain your blood glucose levels)
2. Check your blood glucose more frequently up to every 2 hours
3. You may need to take extra insulin dosages of 2 to 4 units of insulin every 2 to 4 hours or before meals
4. Try to continue eating meals as usual, if you cannot eat meals then take regular snacks throughout the day.
5. Remember high blood glucose, vomiting and diarrhoea can make you lose water and you can become dehydrated, so you need to continue to take sufficient amounts of fluid. (at least a cup of fluid every hour, 250 ml)
  - a. If your blood glucose is more than 15 mmol/l take unsweetened fluids like water, tea without milk or clear soup.
  - b. If your blood glucose is between 10 and 15 mmol/l take fluids alternating between sugar free and sugar containing fluids
  - c. If your glucose tends to be less than 10 mmol/l you can take fluids containing sugar e.g. tea with sugar, diluted apple juice.
  - d. Remember to test your blood glucose every 2-4 hours
6. If you buy flu medicine, make sure that it does not contain sugar or glucose. Most cough mixtures and sore throat lozenges contain sugar and should be avoided.

*When to go to the doctor or to hospital?*

1. If you cannot eat at all and keep on vomiting (more than 3 times in 12 hours)
2. If you feel short of breath, have stomach pain and are vomiting
3. If you have extreme thirst and sleepiness
4. If you have a cold or flu and fever which does not clear up within 2 days
5. If you have cold or flu and fever that is getting worse
6. If you have a fever of 38 °C or more

*Exercise on management of sick days*



You went to a party and had too many sweets and cake to eat, when you got home you start to feel weak and vomit, you also feel short of breath and are breathing faster than usual. What will you do?

What will you do when you wake up in the morning with a blocked nose, headache and flu?



You went to a family meeting and had some chicken that was a bit off, a few hours later you start to vomit and have diarrhoea. What will you do?



Write out a plan on a red card of what you will do when you feel sick and always keep it with you.

(Hand out a red card to every attendee with Diabetic type 1 written on it, ask the attendees to write on the back of the card their action plan and their usual insulin type and dose)

(Give every participant a zip-lock plastic bag to keep the card safe and dry)



## Diabetes Lifestyle Study

### Kalafong Hospital Diabetes clinic

#### Type 1 Diabetes

#### Dietary intervention

##### *What is a diet appropriate for people with diabetes?*

This diet is actually based on the guidelines for healthy eating. It is not extreme, it does not require special foods and it is balanced, which makes it suitable for the whole family.



The diet is also helpful for people with high cholesterol levels, people who have high blood pressure (hypertension) and people who would like to lose weight due to back and knee problems.

##### *What foods are most suitable?*

Unprocessed foods that our ancestors used to eat, are still the most suitable foods, for example fresh vegetables like spinach and tomato; fresh fruit like banana and peaches; fresh chicken, mealies on the cob, dried beans and sour milk.



##### *How do we incorporate these foods into our diet?*

A dietitian can help you with this. A lot of people make use of convenience foods like viennas, packets of soup powder and instant noodles. These foods are high in salt, unhealthy fats and refined starches without fibre or vitamins. For that reason, we should start planning our meals, so that we have enough time to prepare fresh food and so that we have these foods in our house. A lot of fresh food does not require preparation, for example a banana.

##### *Why do you then need special advice?*

People who have type 1 diabetes, do not make insulin. For this reason, the insulin is given from outside in the form of injections. This is a problem, because our bodies usually make small quantities of insulin throughout the day and only as needed. When you take insulin from an injection, quite a lot of insulin enters your body and then you only get insulin again hours later, when you inject again.

This requires careful balancing of what you eat and how much, compared to the insulin injected.

It is therefore impossible to know, if your eating habits match your insulin type and dose, if you do not test your blood glucose regularly.

Every person is unique and therefore everybody has different needs. To control your blood glucose level, requires some detective work. You need to test regularly and write up what and how much you eat, so that it becomes clear how you respond to different foods.

#### *What does the diet look like?*

Nobody else will be eating exactly what and how much you are eating, because everybody responds differently to food and insulin. For that reason you will help the doctors and dietitians a lot, if you could test regularly and write down what and how much you ate. They will then be able to advise you on the insulin doses or type and dietary changes that are needed.

#### *How do I start?*

It is preferable that you eat at regular times, to prevent hypoglycaemic episodes. Your body will become accustomed to this pattern and will warn you if you haven't eaten for a long time.

Once you eat regular meals, you could start introducing small snacks in between meals, especially if you are only injecting twice a day. People who inject twice a day, use a mixture of long –and short-acting insulin, which means that there is a lot of insulin in the body for at least 6 hours after the injection. The snacks should be small, otherwise they qualify as a meal and you may not have enough insulin to deal with the large snack.

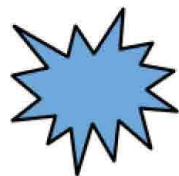


Use snacks that are fresh, like fruit or yoghurt or bread. These snacks should always be packed if you are going on a trip or if you know that you will not be home for hours. This prevents hypoglycaemia and even death.

When shopping for food, take your shopping list that you made from your diet, with you. This will help you to buy the right food and to avoid unsuitable food. You will find that fresh food will cost you less than processed food.

Eat a variety of vegetables and fruit that are in season. This will prevent boredom and it makes your meals interesting. Try new ways of preparing food. This will also make the food more interesting. Ask the dietitian for recipes and advice.

#### *Practical application*



You are visiting your friends. They are going to barbeque some sausages and make pap and gravy. It is already 19h00 and they have not started the fire yet. They are drinking a lot of beer and you are wondering if they will ever get around to lighting the fire. What are you drinking? How are you going to handle the situation?

You overslept this morning and need to get moving, otherwise you will miss your bus to school or work. You cannot eat your breakfast, because there is no time. What do you do? Do you inject insulin or not?



You like slap chips a lot and you often buy some on your way home after school/work. However, every time you do this, your blood glucose measurement is high before supper. What do you do?



You like to play soccer on a social basis with your friends. They sometimes call you on a Saturday or Sunday to join them for a game. The problem is, that you always end up with either a very low blood glucose or a very high one after the game, which means that you always feel sick afterwards. How do you prevent this from happening?



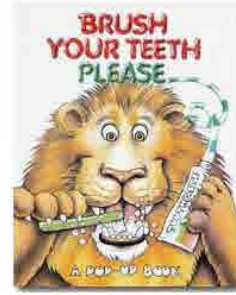
## Diabetes Lifestyle Study

### Kalafong Hospital Diabetes clinic

#### Type 1 Diabetes

##### Diabetes and mouth disease

Diabetic patients are more susceptible to the development of infections and disease of the gums than those who do not have diabetes. Mouth infections also tend to be more severe in diabetic patients than non-diabetic patients. Furthermore diabetic patients who do not have good control over their blood sugar levels tend to have more oral health problems. These infections occur more often after puberty and in ageing patients.



##### The effect of diabetes on gum disease

Because diabetes reduces the body's resistance to infection, the gums are at risk for *gingivitis (infection of the gums)*, an inflammation usually caused by the presence of bacteria in plaque. *Plaque* is the sticky film that accumulates on teeth both above and below the gum line. Without regular brushing of teeth and good mouth hygiene, gum disease may result. If gingivitis is left untreated, it could cause inflammation and destruction of tissues surrounding and supporting teeth, gums, bone and fibres that hold the gums to the teeth which may result in teeth becoming loose and fall out.

You should also take note that infections of the gums can contribute to poor glucose control.

Diabetic patients may have a burning sensation in the mouth as a result of fungal infections, such as *thrush and oral candidiasis*. *Dry mouth (xerostomia)* also may develop, causing an increased risk of tooth decay. To prevent problems with bacterial infections in your mouth, you have to take good care of your teeth with regular brushing or rinsing of your mouth. If infections are present your doctor can prescribe you a mouth wash and sometimes antibiotics may be required. A dentist may prescribe antibiotics, medicated mouth rinses and more frequent cleanings.

Rinsing regularly with salt and bicarb (bicarbonate of soda) could also be beneficial.

*1 cup lukewarm water + 1t Salt, 1t Bicarb – rinse 3-4times per week. Do not swallow the water.*

##### How can I stay healthy?

Make sure to take good care of your mouth and have dental infections treated immediately. Diabetic patients with good dental care and good blood glucose control can avoid gum disease. Brush with a *medium toothbrush* – avoid damaging the gums by brushing too harshly, rather brush softer for a longer period, than too hard for a short period. Use *dental floss* at least 4 times per week to clean between the teeth – do not damage the gums.

*Diet and exercise* may be the most important changes that diabetic patients can make to improve their quality of life and their oral health.

To keep teeth and gums strong, diabetic patients should be aware of their blood sugar levels in addition to having their triglycerides and cholesterol levels checked on a regular basis. These may have a direct correlation on your chances of avoiding gum disease.



If your blood sugar is not under control and you have bad breath, mouth pain, chronic ear ache or loose teeth, talk to your doctor about referring you to a dentist.

Visit the Oral Hygienist annually for the removal of plaque.

Adapted from: <http://www.knowyourteeth.com>

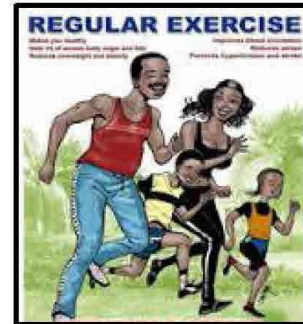
## Diabetes lifestyle

### Kalafong Hospital Diabetic clinic

#### Type 1 Diabetes

#### Exercise

Diabetic patients should lead a life as normal as possible, and physical activity is part of a normal life. Exercise should be enjoyable and fun and therefore every person should select an activity that they enjoy. If you think of exercise as something difficult and too much of an effort, link it with something you like e.g. listening to music or exercise in front of the TV while watching your favourite soap opera.



#### *Exercise is important because it:*

1. Helps insulin work better, so it will improve your diabetes control
2. It helps to keep your body weight in check
3. It relieves stress
4. Improves blood pressure control
5. In the long run it reduces your risk of heart attacks and strokes
6. In general it will make you feel better and you will have more energy

#### *Ways to exercise:*

##### **1. Increase activity in your daily life:**

- a. Take the stairs not the lift
- b. Get off the bus 1 stop before the nearest one to your destination and walk the rest of the way
- c. Get rid of the remote control of the TV and get up to change channels or adjust the volume
- d. Work in the garden

##### **2. Do specific exercise**

- a. Walking or running
- b. Swimming
- c. Play a sport like soccer or netball
- d. Exercise on a stationary exercise machine (spinning bike)
- e. Exercise in the gym
- f. Dancing



#### *How to start*

Start slowly and gradually. If you are not exercising at all at present start with a 5 minute walk every day and gradually increase until you can walk for 20 to 30 minutes. This may take you a month or two to achieve. A good rule to remember regarding the intensity of exercise is: you should exercise so that you can still talk to someone. If you are so out of breath that you cannot have a conversation during exercising, you are exercising too strenuously.

Feel your pulse and count your pulse rate, good exercise should increase your heart rate by 20 to 30%. This means that if your heart rate is 80 beats/min before you start it should go up to 100 to 110 for the most part of you exercising.

When starting with a new exercise activity or when you are increasing the intensity it is a good idea to test your blood glucose before and 1 hour after you have done it (and sometimes during exercise).



Contraindications to physical activity: (ask your doctor at your next visit if you are unsure whether you have these issues or not)

- high risk for cardiovascular incidents (those who previously had a heart condition or have previously not been doing any activity, should start slower and progress to higher intensities slower)
- severe autonomic neuropathy (which prevents your heart rate to increase appropriately and prevents you from feeling that your blood glucose drops)
- severe peripheral neuropathy (This prevents you from feeling your feet well, therefore you should not do impact activities, like jogging. You should be wearing good quality exercise shoes.)
- proliferative retinopathy - eye problems due to diabetes.(should exclude vigorous activity as well as some forms of resistance training which involves straining)
- microalbuminuria and nephropathy - kidney problems due to diabetes. (this indicates that your blood vessels are not healthy any longer and therefore you should have a screening ECG first)

Tips:

1. Always have something sweet to eat available when you are doing strenuous exercise because you may become hypoglycaemic e.g. diluted Energade in a bottle of water.
2. Always wear comfortable shoes when walking or running, make sure you do not injure your feet.
3. Make sure you drink enough water while exercising, you should preferably not feel very thirsty when you finish. (a rule of thumb, drink 250 ml for every 15 min of exercise)
4. You may need to slightly reduce your insulin dose before exercising
5. Get a partner to do exercise with, it will help to motivate you and keep you accountable to maintain your exercise programme.
6. If you are starting to enjoy exercising and you want to step it up a level or two, see your doctor, dietician or educator for advice on how to adjust your insulin dose.
7. When you are uncertain of what an activity will do to your blood glucose, test your blood glucose before, during and after attempting it. Monitor it for up to 2 hours after exercising.
8. Have a written goal to work towards and a plan of action how you will achieve it. Look at the written goal every day and monitor your progress.

#### Exercise on Exercise

1. **Think of ways to make exercise easier for yourself?**
2. **Write down ways you can incorporate increased physical activity in your daily life?**
3. **Write down achievable exercise goals for yourself** e.g. in six months I would like to be able to walk up Khoza Street to Attlyn mall without having to rest once along the way.
4. **Draw up an exercise plan on how you will achieve your goal**

Lead the participants through what type of exercise they enjoy and help them in writing down a plan on how to achieve it.

## Diabetes Lifestyle Study

### Kalafong Hospital Diabetic Clinic

#### Type 1 Diabetes

##### Labelling

When one has diabetes, it is important to know what you are eating. If you prepare fresh food from scratch, you know exactly what you are eating, but if you buy ready-made foods, you have to read the label to know what you are eating.

In *South-Africa*, the law is strict. Companies have to declare everything on the label, so that somebody who has an allergy, can prevent a bad reaction or even death. We cannot use the labels to our advantage however, if we do not know how to read and interpret them.

To understand labels, you have to understand what is good and what is less favourable. We will list the possible *names* that you might see on labels and explain them. We also have to look at *quantities*, because some ingredients can be good, but should be taken in smaller quantities.

When looking at *ingredients*, we look out for words like refined sugar, glucose, glucose syrup, corn syrup, hydrogenated fats or oils, de flavoured apple juice. These ingredients are not necessary for good health and they are not good for people with diabetes.



On the label, you will also find the analyses of the product. Do not be alarmed by the numbers. You simply read numbers using this guide:

Name of nutrient	Quantity/portion	Recommendation
<i>Energy kJ or kcal</i>	300-500kJ (70-120kcal) 800-1200kJ (190-285kcal)	Suitable as a snack Suitable as a meal
<i>Protein</i>	7g or less per serving 7-21g per serving	Suitable as a snack Suitable as a meal
<i>Carbohydrates</i>	30g or less per serving 30-60g per serving	Suitable as a snack Suitable as a meal
<i>Fats</i>	3g or less per serving	Less than 1g saturated fat per serving
<i>Sodium</i>	Less than 350mg per serving	
<i>Fibre</i>	More than 2.5g per serving	
<i>Cholesterol</i>	60mg per portion	

##### Terminology

###### Energy

*Calorie free*: fewer than 5 calories (21kJ) per serving

*Low calorie*: 40 calories (168kJ) or less per serving or 50g of food

*Reduced calorie*: At least 25% fewer calories per serving than the usual product

###### Fat

*Fat free*: less than 0.5g of fat per serving

*Low fat*: 3g or less per serving or per 50g of the food

*Reduced fat*: less than 25% per serving than the usual product

**Saturated fat free:** : less than 0.5g of saturated fat per serving and trans-fatty acids make up less than 1% of total fat  
**Reduced or less saturated fat:** At least 25% less per serving than the usual product

**Cholesterol**

**Cholesterol free:** less than 2mg of cholesterol and 2g or less of saturated fat per serving  
**Low cholesterol:** 20mg or less and 2g or less of saturated fat per serving or per 50g of the food  
**Reduced or less cholesterol:** At least 25% less and 2g or less saturated fat per serving compared to the usual product

**Sodium**

**Sodium free:** less than 5mg per serving  
**Low sodium:** 140mg or less per serving or per 50g of food  
**Very low sodium:** 35mg or less per serving or per 50g of food  
**Reduced or less sodium:** At least 25% less than the original product



**Fibre**

**High fibre:** 5g or more per serving  
**Good source of fibre:** 2.5g – 4.9g per serving  
**More or added fibre:** At least 2.5g more per serving than usual food

**Sugar**

**Sugar free:** Less than 0.5g per serving  
**No added sugars or no sugar added:** No sugars are added during processing or packing, including ingredients that contain sugars, eg. fruit juices, applesauce or dried fruit.  
 Processing does not increase the amount of sugar in the product  
 Products which are similar, usually contain sugar  
**Reduced sugar:** At least 25% less sugar per serving than usual food

**Exercise in label reading**

1. What do you think of salted, roasted peanuts as a snack?  
 YES or NO

2. What do you think of raisins as a snack?  
 YES or NO

3. What will be a better choice at lunch?  
 Tropica drink or Oros

4. Which product is better  
 Cremora or Full-cream milk

5. Which one is better for glucose control?  
 White sugar or Brown sugar or Honey?

6. What is the difference between *oats porridge* and *maltabella*?

7. Which product would you choose?  
*Polony* or *Chicken*?

8. Which product has the lowest fat content?  
*Cracker Jack popcorn* or *Simba chips*?

9. Which one would you choose?  
*100% fruit juice Liquifruit* or *Ice Tea (Lipton)*?

10. Which one would you choose?  
*Moo-moo ice-cream* or *Magnum ice-cream*?



## Diabetes lifestyle Study

### Kalafong Hospital Diabetic Clinic

### Type 1 Diabetes

### Contingency planning

A contingency plan is basically a plan for if your plan does not work.



Remember a few sessions ago we spoke about setting goals. We indicated that when you don't reach your goal or something stops you from reaching your goal, you need to change your goal. Something went wrong and **you need a new plan**.

Contingency planning is a way of preparing for what we will do should something go wrong. A good contingency plan might never be used. E.g. you might have a contingency plan that while travelling you have your emergency contact and important people assigned to your cell phones speed-dial. This is a contingency. You often travel and nothing goes wrong – you never need to use the numbers. But should something go wrong you know that the numbers are in the speed-dial and you won't get stuck thinking "what now".

So this sounds great, but let's make it practical.

You have diabetes – throughout the series we tell you that you need to plan. Plan your diet, exercise etc. You already have some contingency plans that you didn't even know you had.

#### *Example:*

- Many have said that to prevent themselves from eating too much or eating junk, they would eat prior to going to a party.
- Before you exercise, you take a snack to ensure your blood sugar doesn't go too low.
- Before you inject your insulin, you test to ensure you don't inject too much.
- When you feel you're having a hypo, you test to confirm and then eat.

All of these are plans and work as contingency plans, because they allow you to have an answer when a problem arises.



You can set as many contingency plans as you want- as long as you know the plan will help you in case of crisis/emergency.

### Activity

Let's make some contingency plans and then share with the group.

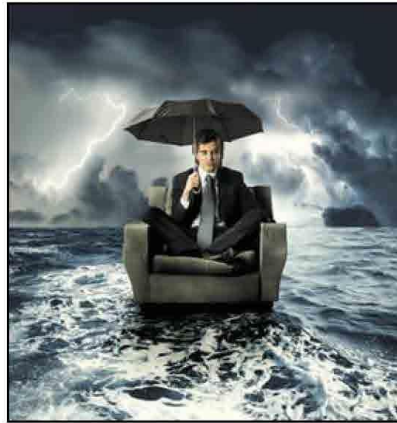
*Tips to help you along:*

- **When will the plan start?**
  - Thus, what must go wrong for the plan to be used?
- **Keep the plan simple**
  - E.g. If I feel very ill – Call sister.
- **Is it a plan you can share**
  - E.g. I get a hypo – family will bring me sugar water.

**Important**

Once you have a few plans that you would like to use you have to test them. You must know the plan well. Test it a few times. If it is a plan that other people share then they too have to practice.

Testing/practicing your plan also helps you to make changes to the plan, so that the plan works well. You will see when you test if it will work.



## Diabetes lifestyle

### Kalafong Hospital Diabetic Clinic

#### Type 1 Diabetes

##### Examinations

Diabetes does not leave you when you work or attend classes or writing examinations. Diabetes is part of your life just as school or work is part of your life. Never use diabetes as an excuse not to work, attend school or to pursue your ideals.



##### School and examinations

High blood glucose may limit your ability to think clearly and will impair your ability to perform optimally in examinations. However, low blood glucose may make you feel anxious and may significantly affect your ability to concentrate. Thus, when you study, attend classes and write examinations you would like your blood glucose levels to be normal or near normal.

Remember if your blood glucose is poorly controlled you may find it difficult to sit through a class or examination because you will need to pass urine frequently.

##### Rules:

1. Your teacher should know that you have diabetes, you should educate them on what to do if you have an unexpected hypoglycaemic episode in class or during an examination.
2. Make sure you always have something to eat with you (quiet hypo food), this is food that is not wrapped in noisy paper and does not make a noise when you are eating it.
3. Before and during examinations it may be difficult to distinguish examination stress from the warning signs of hypoglycaemia (palpitations, anxiety, sweating). Therefore you should get permission from your teachers to test your glucose while writing examinations.


**It is preferable to test before you start an examination.**

4. If you write examinations or attend classes always try to sit near the exit and warn your teacher or the examination supervisor that you may need to temporarily leave the class or examination room to go to the toilet. This will allow you to leave and return quietly without disrupting the class or examination room.  
**Remember:** always ask permission before leaving the examination room
5. You will never be allowed to blame diabetes for poor performance; you will have to pass the examination like everyone else.



Exercise on Examinations

This may be a good opportunity to do role play, select one group member to play the teacher and one to be the pupil. It may also be a good opportunity to review the knowledge of diabetes



1. Explain how you would approach a new teacher to explain that you have diabetes and what he/she needs to know about your condition.

2. What type of "quiet hypo food" can you think of?

3. Tell the group of an occasion that your glucose was high or low and how it influenced your class or examination performance.

IF WE PASS THE TEST  
TONIGHT, WE'LL  
CONTINUE TO  
EVALUATE ON A  
DAILY BASIS.

Sam Harris



## Diabetes Lifestyle Study

### Kalafong Hospital Diabetes Clinic

#### Type 1 Diabetes

#### Stress/ Burnout



#### What is diabetes burnout / diabetes related stress?

Diabetes management often requires a lot of attention and effort. You need to focus on what you eat, how much you exercise, what your blood glucose levels are and when and how much medication you need to take. Sometimes this leaves you feeling tired and demotivated which leads you to neglect your self-care routine. This is a feeling which a large portion of people experience. You can maybe experience it once in your lifetime or as much as numerous times a year. The problem is when you allow it to continue for a prolonged period of time and diabetes related complications start developing.



#### What are the warning signs?

1. Feeling emotionally exhausted or overwhelmed
2. Feeling burdened by diabetes
3. Feeling that diabetes controls your life
4. Feeling angry with negative thoughts which you are struggling to overcome
5. Withdrawal from your support systems like family and friends
6. Disinterest in anything diabetes related such as missing doctors' appointments or neglecting insulin injections or blood glucose testing

#### How do I overcome it?

1. **Recognize** the symptoms and **address** it! Do not allow yourself to loathe in self-pity.
2. No one expects you to be perfect, no one is. This includes your blood glucose levels, striving for perfection is not realistic; rather strive for 'optimal control'. Accept that you cannot control every situation therefore identify what you can and cannot change. Rather improve on things which you can change for instance if you have a high blood glucose value, instead of feeling frustrated and negative rather see it as an opportunity to improve your levels in the future.
3. Realize that everyone needs a break once in a while. Allow your family members to help you with daily tasks and activities like exercising, cooking and buying of groceries. Asking your family or friends to help you out once in a while is acceptable.
4. If diabetes management tasks start becoming overwhelming and too big to handle, then break them down individually and address them one at a time. For instance if you are not able to make enough time for both exercise and eating healthily, then focus on the one until you are able to focus on both. Do not allow yourself to over complicate things; rather break them down and address them individually. If you are struggling to do this, speak to someone about it; whether it is a health care professional, friend or family member.
5. Psychologists are trained professionals and they can help in these situations, if you feel you are struggling to overcome it. Asking psychologists or health professionals for help does not mean you have failed; it means you are actively dealing with it!

#### How do I prevent it?

1. **Exercise** regularly. Exercise not just helps you lose weight or improve blood glucose control; it also helps improve your mood and sense of being.
2. Stay **motivated**. Encourage positive thinking and surround yourself with positive people.
3. Do not compare yourself with what you see in other people; everyone has problems including those that you think are perfect. Set goals for yourself but also allow yourself to be human and to make mistakes every now and then.
4. Bring **positivity** and **fun** into your daily activities. Try new recipes in order to make your meals more interesting, form support groups or weight loss groups and share different experiences with each other, try other forms of exercising like dancing or playing a sport instead of jogging.

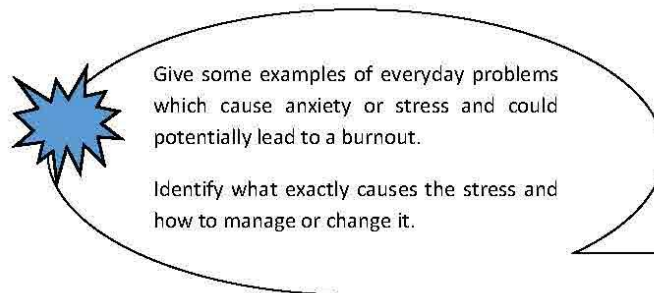


#### Important things to remember

1. Diabetes burnout should not be used to manipulate others in to doing things for you. It is your responsibility to identify it and to address it. If you continually expect others to take over your diabetes management for you then you will lose their support and you will lose your own sense of ability to look after yourself.
2. Diabetes burnout is not allowed to be used as an excuse for neglected self-care. If you are unable to do something seek help, implement the help you have been given and move on.
3. Always know that there is a way out and there is always a way to make things better. We all realize that diabetes management is not easy and it could potentially put a lot of strain on your life, but we know you can do it and we are willing to walk the path with you.

#### Exercise on diabetes burnout/ stress

Each group gets an exercise sheet with the image of a traffic light.



Each group needs to give five examples and share with the other groups.

EXAMPLE



**STOP** and identify the things which cause stress, anxiety or sadness

e.g. "I hate taking injections"

**THINK** why it makes you feel that way. Why does it cause so much stress?

e.g. "because it hurts, maybe I am not alternating the injection site often enough?"

**GO** and do something about it and change your feeling or attitude about it.

e.g. "I can try a new injection site"





A series of horizontal dashed lines for writing, consisting of 20 lines.

## Diabetes Lifestyle Study

### Kalafong Hospital Diabetes Clinic

#### Type 1 Diabetes

#### Depression



This session looks at depression and clarifies the difference between stress or feeling down and depression. The goal of the session is to highlight that depression can affect anyone and that there is help available.

#### *What is depression? How is it different from stress?*

All of us have times we feel sad. Most of the time the feeling passes. Depression is when the feeling does not pass and instead it starts to interfere with your daily life.

#### *So how do you identify it?*

- Like we said you notice you're constantly feeling sad, anxious or empty
- Constant pessimism – you only see the bad and not any good
- You feel hopeless
- You may be irritable
- You no longer have interest in people or hobbies
- Might have low energy levels
- It is hard for you to concentrate
- You're eating habits change
- Your sleep pattern changes
- All of this could make you start to have suicidal thoughts and even your body might start having pain, cramps and digestive problems etc. that don't go away.

*(What is depression? What causes depression?*

*<http://www.medicalnewstoday.com/articles/8933.php>)*

Winston Churchill – (a British leader) suffered from depression and called it a black dog. Let's look at a video where depression is again explained by describing depression as a black dog.

#### **Video – I had a black dog (WHO) “Available on YouTube” 4.18 min**

Show the above video. The video again explains depression. The video then goes further by showing it can be overcome.

#### *Discussion*

No one yet knows exactly what causes depression so it is easy for us to miss. If any of you here today identify with this video please talk to us after the session so we can link you with people that can help you to overcome your own depression.

As you saw in the video depression can be treated. Treatment differs between people. If you have already spoken to doctors or psychologists about your depression and you feel that it is still not any better don't give up. It won't be easy but we will be there with you as we find what works for you.

### Care givers

Now many of you here today might think that this is not so important because you are not suffering from depression. But if you think about it depression can come at any time and even if you are not suffering from it what about your family, your friends the people you work with or go to school with.

Depression does not only affect the one that has depression but also everyone around that person. Let's look at another video that explains this.

### Video – Living with a black dog (WHO) “Available on YouTube” 5.56 min

Show the video – video provides information on how to approach and help a person that suffers from depression.

### Discussion



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*Have group members:*

---

- *Discuss who they talk to when they are feeling down.*
  - *What can you do to take your mind off of your problems when you are down?*
  - *Have you ever felt you need help because you weren't able to get rid of feeling down?*
  - *If you felt like this, talk to the facilitator after the session.*
- 

The video showed how we can help anyone we might know who struggles with depression. We are stronger together. Who knows, one day we may need someone else to help us.

Again, feel free to talk to us. Even if we don't have the answer, we will help you look.

### Activity

**Reframing**

**Memory Manipulation**

**Collapsing anchors**

**Pattern interruption**

## Diabetes Lifestyle study

### Kalafong Hospital Diabetes Clinic

### Type 1 Diabetes

### Sexual health



This is a topic not often discussed, but it is very important and relevant in Diabetes. Women are more likely to seek medical advice from their health care providers than men, but this does not mean that men do not have issues relating to sexual health.

**To practice responsible sexual behaviour is the responsibility of each individual and has nothing to do with traditions, cultures and customs. ACCEPT RESPONSIBILITY FOR YOUR OWN ACTIONS.**

#### **FEMALE SEXUAL HEALTH**

Pregnancy, menstruation, birth control and menopause are all uniquely female circumstances and they could all influence your glucose control.

**Premenstrual Syndrome** Many women have the so-called PMS for a few days prior to their menstruation. You could feel tired, bloated, have trouble sleeping, possible headaches, joint pains, appetite changes or food cravings and/or mood swings. Some women have a low sex drive, breast swelling, trouble concentrating and/or weight gain. This usually goes away within the first 3 days of menstruation. In some cases the blood glucose may increase and in other instances drop. The only way to know what your glucose does before menstruation, is to test (and chart the results) more often, e.g. 3 to 4 times daily for the 3 days prior to your cycle.

#### **Menstruation**

Most women find their glucose levels to normalise within 3 days of the beginning of their cycle, but may find lower than normal values OR higher than normal values during this period. It should be tested more often, e.g. 3 to 4 times daily.

#### *How to deal with changes in your glucose before and during periods*

- Test more often for a few months to establish a pattern.
- Chart these results.
- Discuss the results with your health care practitioner.
- Work at a plan for the future periods with your health care practitioner.

#### *Strategies for high glucose levels before and during periods*

- Work with your health care team and increase the insulin dose in small increments, e.g. 1 or 2 units extra per day. Test often.
- Return to your usual insulin dose of insulin within the first 3 days of your period, according to your glucose values.
- Eat at regular intervals, when possible.
- Try to avoid eating extra carbs. Keep crunchy vegetables in your bag, like celery, radishes, cucumbers. Dip them in salsa / tomato ketchup.
- Cut back on alcohol, chocolate, caffeine. It affects your mood and glucose levels.
- Cut back on your salt (sodium) intake. It causes bloating.
- Be more physically active. This diminishes mood swings, excessive weight gain and makes the management of the glucose levels much easier.

### Strategies for low glucose levels before and during periods

- Work with your health care team and decrease the insulin dose in small increments, e.g. 1 or 2 units less per day. Test often.
- Spread your carb intake over the course of the day. Multiple small meals could help manage your glucose levels.
- If you decide to work out, eat a small amount of carbohydrate 30 minutes before you do. Test the glucose before and after the work out.

## Pregnancy

### Pre-pregnancy exam

- A thorough physical examination needs to be done before you conceive
- Tests to be done include HbA1c blood test (to have the best chance of having a normal healthy baby the HbA1c needs to be in the range of 6.5%)
- Assessment of any complications, such as high blood pressure, heart disease, kidney, nerve and eye damage. If any of these complications are present, it needs to be treated before you conceive.
- A full review of all the medications that you are taking are necessary, including herbs and supplements, to make sure they are all compatible with a safe pregnancy.

**All of the baby's organs are formed during the first 6-8 weeks of pregnancy, which may be before you know you are pregnant**

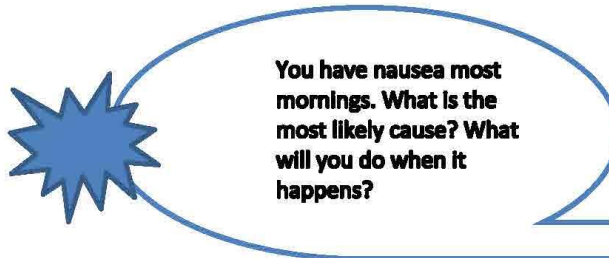
### The effects of high glucose on the unborn baby

- Greater chances of a birth defect, remember that the organs are formed in the first 6 weeks after conception.
- There is a higher risk of spontaneous miscarriage if the glucose is uncontrolled
- When the glucose levels are as near to normal, the risk for birth defects is about the same as for women without diabetes. Keep the glucose levels on target (between 4 and 7mmol/L), and the HbA1c as near to 6.5% as possible.
- Mothers who begin intensive diabetes management **after** conceiving are more likely to have babies with birth defects.

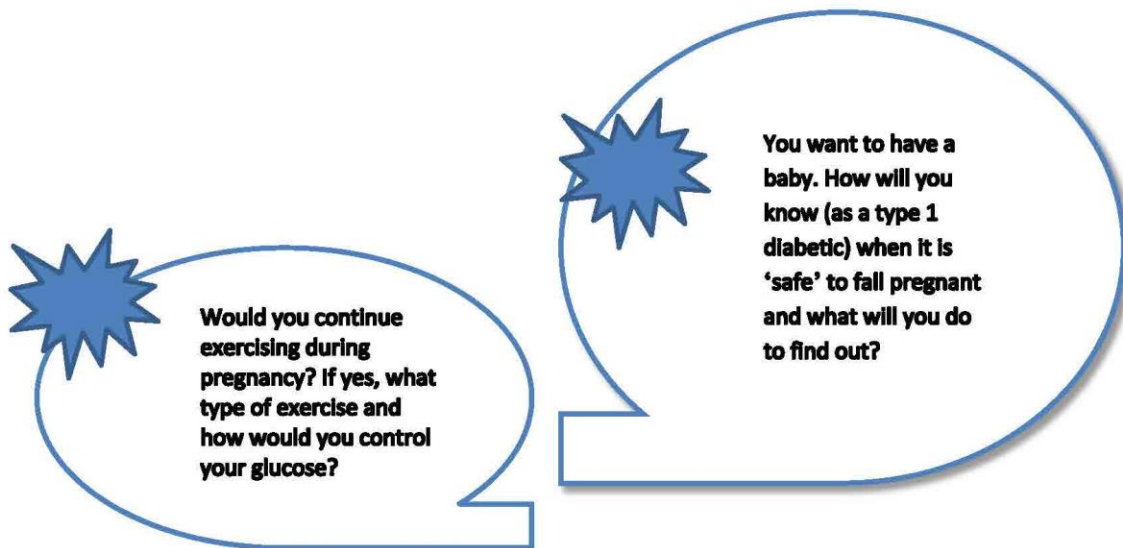
### During pregnancy

- You may need more insulin during pregnancy
- Testing often is the cornerstone of treatment in pregnancy – 4 times daily or even more (before each meal and at bedtime).
- You may need to increase the insulin over the pregnancy period
- Follow-up at a good obstetric unit initially every 4 weeks and later every 2 weeks to assess the baby's growth, mother's glucose control, blood pressure, etc.
- Delivery takes place at 38 weeks (and not like the normal 40 weeks) due to silent deaths of babies in the last 2 weeks in diabetic mothers. This could be through normal vaginal delivery or caesarean section, depending on many different factors, e.g. baby's weight, mother's pelvis, etc.
- Try not to gain too much weight in pregnancy. (8-12kg is safe).
- Eat small, regular meals, e.g. 6 meals per day, avoid alcohol, caffeine, fatty foods.

### Practical Application







### Sexual function and Commonly Asked Questions

Many factors can result in sexual difficulties, including medications, hormonal changes, problems caused by diabetes and your emotional health. Depression is a very common cause for sexual problems – diabetes is not easy to manage and often lead to depression.

#### ❖ Problems with arousal

There is a very strong link between mind and body. If a woman does not feel in the mood for sex, then her body does not respond the way it needs to in order for her to enjoy it. If she is not emotionally ready or interested in sex, she will be less likely to enjoy it physically.

#### Common causes for lack of arousal

- Vaginal infections
- Bladder infections
- Vaginal dryness
- Fear of pregnancy
- Depression
- Medications used to treat depression



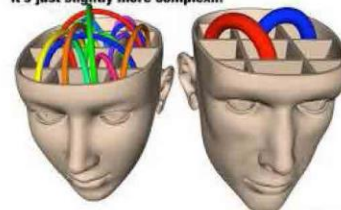
#### ❖ Lack of sexual desire

Some women feel they are just too tired, trying to cope with busy lives, caring for children and also working. Diabetes adds more stress to their lives and they also feel less sexy. Depression could be an underlying cause which decreases interest in sex. It could happen more during menstruation that you have less energy for sex.

#### Tips to increase your desire

- Treat dryness with lubricating gels e.g. KY-jelly, but any cream will do.
- Treat vaginal infections if necessary.
- Treat depression if necessary.
- Do a quick glucose check before sex if you are worried about a hypo during sex. Keep something to treat a hypo nearby to eat if necessary.
- Help set the stage for you and your partner – candles, music, etc. Take time, let your partner know what will help you feel more romantic.

Female sexual arousal isn't weaker than men's, it's just slightly more complex...



❖ Vaginal infections

Yeast (Candida) infections are more common in diabetes, due to the fact that the bacteria grow better in the high glucose environment. It has nothing to do with how clean you are, your age or sexual activity. Treatment could be 1 vaginal pessary (Canesten VC) available as over the counter medication, but it could also sometimes be more difficult to treat.

❖ Urinary tract infections

Bacteria grow in a high glucose environment –more often seen in diabetic patients.

Signs of bladder infection: Going to the bathroom to urinate more often, burning urine, painful intercourse blood in the urine (or it shows as brownish urine).

Treatment includes antibiotics, but cranberry juice could also help or prevent these infections. Avoid public toilets (try not to sit on the toilet seat), drink extra water, clean the private parts from the front to the back (especially when you have passed stools), empty your bladder after intercourse.

❖ Birth control

Practicing birth control and safe sex are important for anyone, but especially for women with diabetes. You don't want to be caught off guard. Instead, you want to plan and prepare for a pregnancy as much as possible to ensure optimal health for you and your baby.

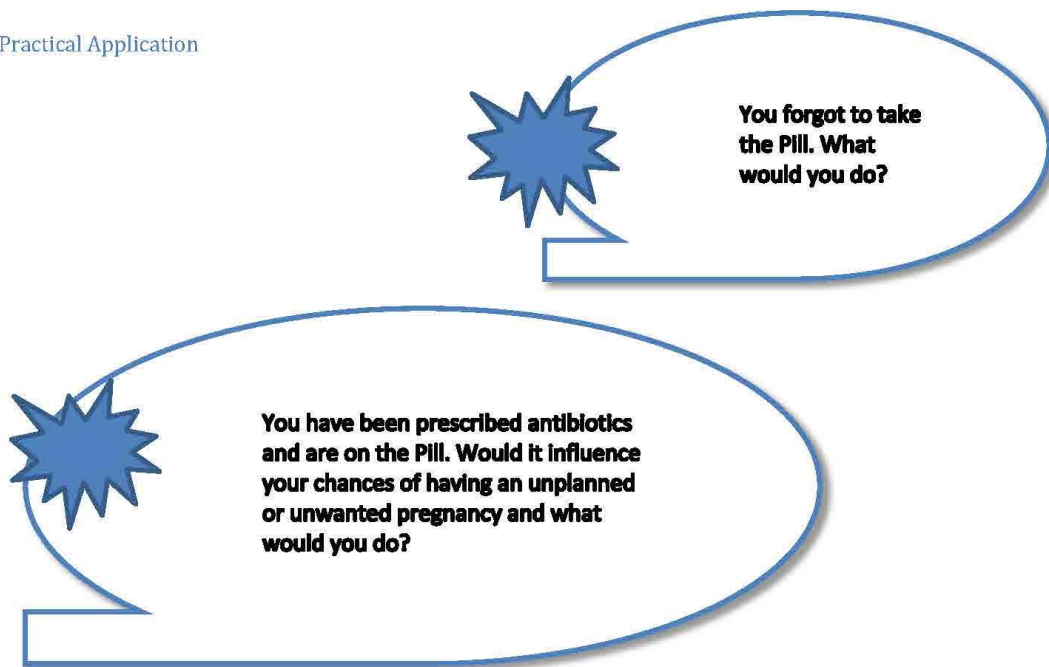
**Why It's Important**

This will help you get your blood glucose on target before you become pregnant – HbA1c 6.5%.

**Types of birth control**

- ❖ Women with diabetes have the same birth control options as other women. These include the Pill (available as pills, patches, injections), intrauterine device (IUD), rhythm method (not very reliable as birth control method), barrier methods, spermicides, sterilization. Which method you choose will depend on your own personal and family health history and your individual preferences. If you have any special concerns, be sure to bring them up with your health care team.
- ❖ The methods that contain hormones may influence your blood glucose, so test more often in the first few weeks or months after changing to the pill or injections for contraception.

**Practical Application**



**You forgot to take the Pill. What would you do?**

**You have been prescribed antibiotics and are on the Pill. Would it influence your chances of having an unplanned or unwanted pregnancy and what would you do?**

## Diabetes Lifestyle study

Kalafong Hospital Diabetes Clinic

Type 1 Diabetes

Sexual health



### MALE SEXUAL HEALTH

In general, men are less likely to seek medical advice from their health care providers than women. However, men with diabetes should have more reason than anyone to reverse this trend. There are many factors that influence your sexual health, including medications, hormonal changes, your diabetes, and your emotional health.

#### ❖ Sexual Activity

If you are prone to hypoglycemia when you work out or at night, you may also have a low blood glucose reaction following sexual activity. This can be especially true if you have sex at night. This is when your blood glucose levels typically dip, so you may need to adjust your insulin or have a snack before or after sexual activity. Be especially careful if you are combining sexual activity with alcohol.

**Take responsibility for your sexual life. It may lead to an unwanted pregnancy in an unstable relationship at a stage that you can ill afford such a complication in your life.**

#### *Avoiding Lows During and After Sex*

- If you use insulin, you need to be watchful for low blood glucose during or after sex.
- Check your blood glucose first. This may slow you down a bit, but it's better than having to deal with low blood glucose at an inopportune moment.
- Eat just before or right after active sex, just as you would if you were exercising.
- Consider having a snack before going to sleep for the night (after sex).

#### ❖ Birth control

- There are not many ways for a man to practise birth control, and the most important one is the use of a condom.

The condom is a thin sheath that is placed over the penis before intercourse and is a common form of birth control. It prevents the sperm from entering the woman's vagina. When used correctly, the condom is 85–90% effective in preventing pregnancy. The condom should be put on before intercourse and can be removed soon afterward.

- Vasectomy – this is a small (permanent) operation that will prevent the release of sperm into the seminal fluid. You will still experience the full pleasure of intercourse, but not be capable of causing a pregnancy.
- Abstinence (?)

#### ❖ Safe sex

It is important not to sleep around, but have a stable relationship with one partner. It is a myth that you will prove your manhood by the amount of women you sleep with and this is actually a very dangerous view that often leads to the spread of STDs and AIDS.



Condoms also help prevent the spread of several sexually transmitted diseases, including gonorrhoea, chlamydia and AIDS and is also seen as a form of safe sex.

If you are HIV positive, you need to always use a condom, to avoid spreading the virus to your partner.

### ❖ Erectile Dysfunction (ED)

ED is the inability to get or maintain an erection for sexual activity. This could be a complication of diabetes, but many other reasons exist. Also called **impotence**. It is difficult to know how many men with and without diabetes suffer from this problem, because so many men suffer in silence and do not discuss sexual issues with their healthcare provider.

#### *ED Facts*

- ED is age related. It is primarily a problem among men over 40, with and without diabetes.
- Of all men with diabetes over the age of 50, it is estimated that 50–60% have some degree of ED.
- Some studies have suggested that the risk of ED is much higher in men with diabetes.
- ED has a range of severity. The above statistics include all types of ED, from occasional to complete. Complete ED (the complete inability to have an erection) occurs much less often.
- Men with diabetes develop ED 10 to 15 years earlier than those without diabetes.

#### *So just what is ED?*

Having ED means that most or all of the time, the penis fails to become or stay hard enough for sexual intercourse. If you have ED, you can't achieve or maintain a satisfactory erection.

If, on occasion, you fail to maintain or achieve an erection, you do not have ED.

You also do not have it if you experience a decrease in sexual desire, have premature ejaculation, or if you fail to ejaculate or reach orgasm.

#### *Causes of ED*

- Physical or psychological factors—or both—can cause ED. Sexual desire begins in the brain, and signals are sent through the nervous system to the blood vessels to trigger an erection.
- The male sex hormone testosterone is also involved in sexual desire and achieving erections and in rare cases, low amounts of testosterone can cause ED.
- The most common causes of ED in men with diabetes are blood-vessel and nerve related damage.
- Depression could also cause ED and is treatable.
- Certain medications could cause temporary ED – blood pressure tablets, tablets used for stomach ulcers, some OCM.
- Smoking may cause ED
- Alcohol may cause ED.

#### *Prevention of ED*

- Keep your blood glucose as close to normal as possible.
- Quit smoking.
- Do not drink heavily.
- Keep your blood pressure near normal.

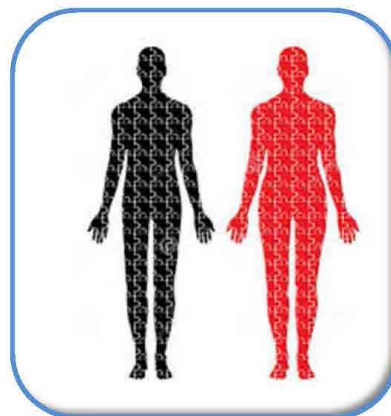
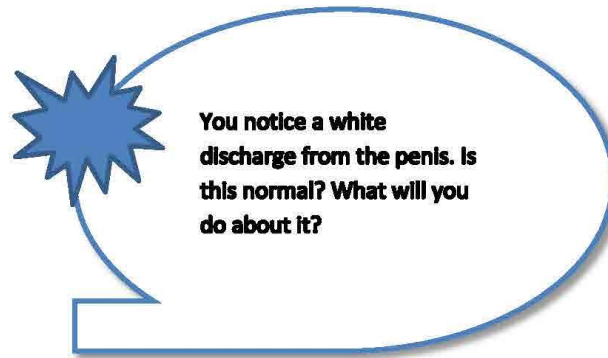
#### *Treatment options for ED*

- Stop bingeing alcohol, stop smoking
- Medications e.g. Viagra, Levitra – These medications could have side-effects and cannot be used by people with heart problems
- Penis injection 30-60 minutes prior to intercourse into the penis
- Implant – a pump device with a penile prosthesis planted into your body
- Testosterone injections if the testosterone level (in the blood) is low. This could however lead to liver cancer if used for a long period.
- Psychotherapy for you and your partner



All of the treatments for ED have risks or drawbacks. You may decide to seek no treatment. Some men and their partners choose to express their sexuality in ways that do not involve intercourse. If you do want to consider treatment, you need to tell your provider, even if you are not asked about your sexual life. Your provider can only assist you if you let him or her know about your concerns.

#### Practical Application

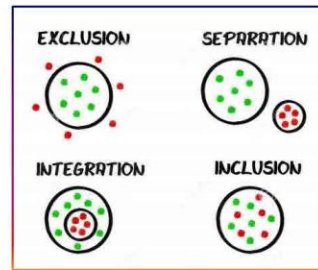


## Diabetes Lifestyle Study

### Kalafong Hospital Diabetic clinic

### Type 1 Diabetes

### Social integration



#### Background

Social integration refers to the strength of the attachment that you as an individual have with the community that you live in. It also refers to the possible constraints that are in your community that might hinder you to live a healthy life. Social integration refers to informal involvement with friends and relatives, as well as formal engagement, with your employer, college, school, religious institution and sport club.

When you are well integrated into your community you stand a better chance of accessing the social resources of your community. A good combination of the social resources in your community, called social capital, can be beneficial with regard to your health and the health of other people with health problems.

#### Cultivating social capital and a higher sense of social integration

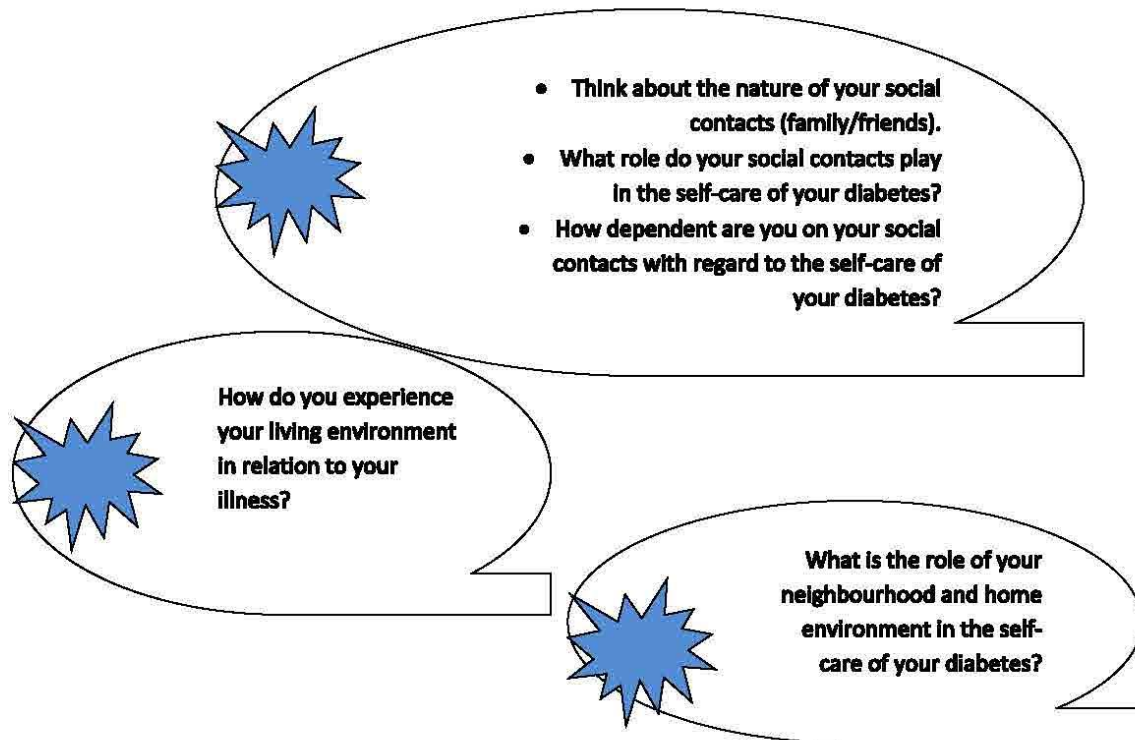
The foundations for social capital are trust in others, norms, participation and networks of interaction that can improve the efficiency of your community by coordinated action. People who are better connected are healthier, or can cope better with the adversity of an illness such as diabetes.



Consider the following aspects regarding your community:

**Identify the social resources (community organizations, e.g. support groups, religious groups) in your community that can assist you with the self-care of your diabetes.**

**If you are already using these resources, think about your experiences with the utilization of these resources in relation to your illness.**



#### Overcoming some constraints to effective diabetes self-care

- Acquire knowledge and understanding about diabetes and diabetes self-care.
    - Acquire knowledge and understanding of a specific dietary plan, a specific exercise plan and a stress management programme.
  - Share your experience of possible helplessness and frustration from lack of glycaemic control, despite adherence, with other people with diabetes.
    - Attend information and health education sessions about more effective application of the prescribed medication, diet, exercise, etc.
  - Mobilise or become involved in a group that can support you with regard to difficulties that you might experience in for example remembering to take medications, knowledge about medication side effects, schedules and adjustments.
    - Identify the traditions, culture and customs in your community that play a role in the self-care of your diabetes?
    - Share these experiences in respect to traditions, culture and customs with other people with diabetes.
      - Become involved in community activities.
- **S**hare **U**buntu.

