

**THE EFFECTS OF GROUP COGNITIVE  
BEHAVIOURAL THERAPY (CBT) ON STRESS  
AND PSYCHOLOGICAL WELL-BEING IN  
ADULTS WITH TYPE 2 DIABETES**

**by**

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## **DEDICATION**

*This thesis is dedicated to my parents, who have raised me to be the person I am today. Thank you for all the unconditional love, guidance, and support that you have always given me*

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**PENGARUH TERAPI KOGNITIF TINGKAH LAKU (CBT) KUMPULAN TERHADAP TEKANAN DAN KESEJAHTERAAN PSIKOLOGI ORANG DEWASA YANG MENGHIDAP PENYAKIT KENCING MANIS (JENIS 2)**

**ABSTRAK**

Kencing manis atau dikenali sebagai Diabetes Mellitus dalam bahasa Inggeris adalah penyakit kronik, progresif yang telah mencapai tahap wabak di seluruh dunia dan juga sangat lazim di Malaysia. Faktor psikologi seperti tekanan, kemurungan, dan kegelisahan dalam pesakit kencing manis dikaitkan dengan tahap yang tinggi komplikasi glisemik dan kencing manis. Oleh itu, pembangunan dan pelaksanaan klinikal intervensi psikologi yang berkesan adalah penting. Antara intervensi tersebut adalah Terapi Kognitif Tingkah Laku (CBT) yang diluluskan dan disyorkan oleh para profesional sebagai kaedah empirik yang disokong untuk rawatan penyakit kencing manis di seluruh dunia. Objektif kajian ini adalah untuk menentukan sama ada penyertaan dalam CBT kumpulan akan menyebabkan pengurangan tekanan akibat kencing manis dan peningkatan kesejahteraan psikologi serta kawalan glisemik menghampiri tahap yang boleh diterima dalam kalangan orang dewasa yang menghidap kencing manis jenis 2 di Malaysia. Peserta kajian ini terdiri daripada 60 orang dewasa yang menghidap kencing manis jenis 2 (berusia 20-65) dengan  $HbA1c \geq 7.5$  dari Pusat Sejahtera (klinik Universiti Sains Malaysia). Mereka dipilih melalui teknik pesampelan *convenience*. Selepas menandatangani borang persetujuan bermaklumat, peserta melengkapkan Soal Selidik Kesejahteraan (W-BQ 22) dan Skala Tekanan Kencing Manis (DDS-17). Peserta yang berminat untuk menyertai terapi dimasukkan ke dalam kumpulan eksperimen manakala peserta yang tidak berminat dimasukkan ke dalam kumpulan kawalan. Kumpulan eksperimen ( $n = 30$ ) menerima terapi CBT manakala kumpulan kawalan ( $n = 30$ ) tidak

menerima terapi tersebut. Model statistik yang digunakan untuk menguji kesan intervensi adalah campuran *between-within ANOVA*. Kumpulan-kumpulan eksperimen dan kawalan digunakan sebagai faktor antara kumpulan, manakala tekanan kencing manis, kesejahteraan psikologi dan tahap HbA1c sebelum dan selepas terapi digunakan sebagai faktor dalaman kumpulan. Selepas program selama tiga bulan tersebut, penurunan yang signifikan dalam tahap tekanan dan peningkatan dalam tahap kesejahteraan psikologi diperhatikan dalam kalangan peserta kumpulan eksperimen tetapi bukan peserta kumpulan kawalan. Keputusan ini juga menunjukkan bahawa terapi CBT dapat membantu peserta untuk mencapai tahap HbA1c yang lebih baik berbanding dengan kumpulan kawalan. Keberkesanan CBT kumpulan dengan matlamat untuk meningkatkan kawalan glisemik, mengurangkan tahap tekanan dan meningkatkan tahap kesejahteraan psikologi adalah selaras dengan penyelidikan sebelumnya untuk pesakit kencing manis jenis 1 dan jenis 2 di seluruh dunia. Para penyelidik, Kementerian Kesihatan dan kerajaan perlu memberikan penekanan dan komitmen untuk penjagaan psikologi sebagai suatu cara untuk mengurangkan kencing manis dalam kalangan orang dewasa di Malaysia.

# **THE EFFECTS OF GROUP COGNITIVE BEHAVIOURAL THERAPY (CBT) ON STRESS AND PSYCHOLOGICAL WELL-BEING IN ADULTS WITH TYPE 2 DIABETES**

## **ABSTRACT**

Diabetes mellitus is a chronic, progressive disease that has reached an epidemic level around the world and is a highly prevalent condition in Malaysia as well. Co-morbid psychological factors such as stress, depression, and anxiety in diabetics are associated with high levels of glycemic and diabetes complications. Therefore, the development and clinical implementation of effective psychological interventions are important. One such intervention is Cognitive Behavioural Therapy (CBT), which is approved and recommended by professionals as an empirically-supported method of treatment for diabetes around the world. The objective of the present study was to determine whether participation in group CBT would result in a decline in diabetes distress and improved psychological well-being, as well as a glycemic control closer to an acceptable level for adults with type 2 diabetes in Malaysia. The participants of the present study were 60 type 2 diabetes adults (ages 20-65) with  $HbA1c \geq 7.5$  from Pusat Sejahtera (Universiti Sains Malaysia clinic) who were selected by the convenience sampling technique. After signing written informed consent, participants completed the Well-Being Questionnaire (W-BQ 22) and Diabetes Distress Scale (DDS-17). The participants who were interested to join to therapy were assigned to the experimental group, and those who were not interested were assigned to the control group. The experimental group ( $n = 30$ ) received group CBT, whereas the control group ( $n = 30$ ) received no therapy. The statistical model used to test the effect of the intervention was a mixed between-within ANOVA. The experimental and control groups served as the between-group factor, and diabetes

distress, psychological well-being and HbA1c levels before and after therapy served as the within-group factors. After the three-month programme, a significant decline in the level of distress and an improvement in the level of psychological well-being were observed among participants from the experimental group, but not for those in the control group. The results also suggested that the therapy could help participants to achieve more acceptable HbA1c levels compared to those of the control group. The effectiveness of group CBT, with its aims to improve glycemic control, decrease the level of distress and increase the level of psychological well-being, was consistent with previous research for type 1 and type 2 diabetes patients around the world. Researchers, the Ministry of Health, and the government must give due interest and commitment to psychological care as a pathway to diabetes mitigation among Malaysian adults.

# CHAPTER 1 INTRODUCTION

## 1.0 Overview

Diabetes, the third most widespread disease, is one of the most important causes of mortality in the world (Centresfor Disease Control and Prevention, 2011). Yet, the worldwide prevalence of diabetes is increasing at an alarming rate (Shaw, Sicree, & Zimmet, 2010). According to the World Health Organization (2003), approximately 150 million people worldwide have diabetes mellitus. The number of diabetes mellitus cases may double by the year 2025, because the age of the world population is rising, and obesity together with the lack of physical activity are becoming commonplace (Centres for Disease Control and Prevention, 2011). Southeast Asia is expected to have the largest number of diabetes cases by the year 2025 with an estimated prevalence of 13.5%, which can be translated as approximately 145 million people (Letchuman et al., 2010).

People aged 65 and older face the highest rate of risk of developing diabetes in the developed countries. However, the number of diabetes cases in individuals between 45 and 64 years old has also been increasing in the developing countries including Malaysia(Hau, 2008). According to the Malaysian Burden of Disease and Injury Studies, 2,261 deaths (857 male and 1,404 female) in the year 2000 could be attributed to diabetes (Fauzi, Budin, Azwan, & Yuen, 2007).

Given the high prevalence of diabetes in Malaysia and the complications associated with this disease, the present study focused on psychological complications of

diabetes. The present study adopted group CBT as a psychotherapy model for Malaysian type 2 diabetics in order to help them regain control of psychological complications of diabetes. More specifically, the study aimed to examine the effectiveness of group CBT in decreasing diabetes distress and increasing psychological well-being along with better control of blood sugar level in Malaysians who are suffering from type 2 diabetes.

### **1.1 Types of Diabetes**

Diabetes consists of three types. The most common types of diabetes are the first and second types. Diabetes type 3 is caused by genetic factors, infection, or is perhaps immune-mediated. The bodies of those who suffer from the first type of diabetes cannot make any insulin or the amount of insulin made in the body is almost nil, therefore, they need to inject insulin (American Diabetes Association, 2008a). While people with type 2 diabetes are capable of producing insulin, some people's bodies are resistant to insulin and/or cannot make enough of this hormone. In all types of diabetes, glucose is not delivered to cells; instead it is produced in the bloodstream (American Diabetes Association, 2008a).

### **1.2 Diabetes-Related Complications**

Perhaps the hardest part about living with diabetes is thinking about the possibility of complications. Keeping blood sugar levels close to a normal level can help prevent or delay the occurrence of diabetes-related complications (Kaufman, 2002). These complications can be physical and/or psychological in nature.

A high level of glucose in the blood is the cause of nearly all physical complications of diabetes (Karlson & Agardh, 1997). The clogging of small blood

vessels is a major problem and is the cause of many health problems associated with diabetes (Connell, 1991). The most common physical complications of diabetes consist of retinopathy (loss of vision), nephropathy (a type of kidney problem), brain stroke, atherosclerosis, and decreased sexual feelings or activities (American Diabetes Association, 2008b).

People who are diagnosed with diabetes behave differently and often unexpectedly in reaction to being considered as a diabetic. Therefore, psychological interventions are essential for achieving the proper balance. Poor management can lead to inappropriate blood glucose levels; it also can contribute to poor quality of life, and is often the cause of different psychological complications such as the lack of personal confidence. These complications can be considered as an abnormal cycle (Centres for Disease Control and Prevention, 2003).

### **1.3 Stress in People with Diabetes**

The complexity of the association of diabetes and stress is a very popular topic of study today. However, only a small number of studies have been conducted in this area (Lloyd, Smith, & Weinger, 2005). In fact, many researchers are interested in the influence of stress on metabolic control and regimen adherence. Stress affects metabolic control directly by its impact on cortisol and other catabolic hormones that interfere with insulin metabolism. Stress might also affect metabolic control by interfering with the individual's self-care tasks. As a result, the effects of stress on metabolic control are mediated by a variety of "counter-regulatory" hormones, which are released in response to stressful situations. This procedure results in elevated blood sugar levels and decreased insulin performance in the human body (Lloyd et al., 2005).



#### **1.4 Psychological Well-Being in People with Diabetes**

Psychological well-being is related to the individual's representation of the condition, and also is related to physical symptoms and social experiences (Debono & Cachia, 2007). Physical symptoms in diabetes care usually include temporary hypoglycemic or hyperglycemic and long-term complications (Eiser, Riazi, Eiser, Hammersley, & Tooke, 2001). A diabetic's well-being is often linked to the individual's insight regarding his or her capability of coping with the everyday demands of the diabetes condition and its treatment difficulties. Fulfilling social obligations, sustaining social relationships, maintaining better metabolic control, and preventing or delaying the onset of diabetes complications are the other preoccupations (Bradley & Lewis, 1990; Karlson & Agardh, 1997).

A poor level of psychological well-being among diabetics has been suggested to be related to the more severe complications of diabetes (Haire, Joshu, Heady, Thomas, Schechtman, & Fisher Jr, 1994; Karlson & Agardh, 1997; Peyrot & Rubin, 1997). Diabetics who are living with severe problems due to long-term complications may become permanently disabled, which would cause a considerable increase in the negative effects on their psychological well-being (Karlsen, Bru, & Hanestad, 2002).

#### **1.5 Cognitive Behavioural Therapy and Diabetics**

Cognitive Behavioural Therapy (CBT) is a goal-oriented, evidence-based and highly structured treatment that aims to deal with the patient's current problems. In CBT, the patients and clinicians mutually agree upon goals that are geared towards

improving the distressing emotional states and unhelpful and harmful patterns of thinking and behaviour on the part of the patient. A normalizing treatment rationale is central to the cognitive-behavioural model. Emotional responses that characterize anxious and depressive states are observed to exist on a continuum, with normal emotional reactions experienced every day (White & Freeman, 2000).

CBT can be provided in a group setting as well. Group CBT has been initiated in many hospitals because of its identifiable timeframe, and because it offers a safe and effective alternative to medication (White & Freeman, 2000). The therapy can be useful for countering the negative distortions commonly experienced by depressed patients, whose ability to achieve goals and carry out daily activities is ultimately disrupted. Hence, Group CBT is geared toward identifying and correcting such negative distortions (Gavard, 2009; Palinkas, Barrett, Connor, & Wingard, 1991).

As with patients who have chronic medical conditions, the prevalence of psychological problems, especially anxiety and depression, are high among diabetics (Bell et al., 2005). Anxiety and depression symptoms have a great impact on a patient's ability to cope with diabetes, and their association with metabolic control in the population has been established in different research (Gonzalez, & McCarl, 2010). Such symptoms caused by the disruption of self-care routines may result in diabetes as a manifestation of individuals' physical and emotional well-being (Centres for Disease Control and Prevention, 2003). So, using group CBT for people who are suffering from diabetes can lead to the control of psychological complications of diabetes, which will result in better self-care behaviour.

## 1.6 Problem Statement

Controlling diabetes is not easy because of the chronicity of diabetes, the need for daily decision-making, the ways of controlling the condition, and the seriousness of its complications. People who are suffering from diabetes must repeatedly and carefully manage their regimen and most daily activities such as eating, sleeping, and physical activities. Patients also need to be aware of their glucose levels as well as their medications, and their blood sugar must be kept within the acceptable range.

During the past twenty years, continuous rapid socio-economic growth has resulted in significant changes in the lifestyle of Malaysian society, such as a dietary pattern containing more fat and oil, and so on. These changes have resulted in the production of insufficient energy from carbohydrates and a rise in the contribution of fat, resulting in an increased risk of diabetes (Tee, 1999).

According to Tee (1999), the majority of families in Malaysia usually eat in restaurants, skip main meals due to lack of time, and students do not eat breakfast and prefer fast food. Tee (1999) also believed that the significant negative impact of such bad eating habits is demonstrated in the high prevalence of viral non-communicable diseases like type 2 diabetes. If people with diabetes do not receive proper treatment, they will face a greater risk of developing depression, anxiety and a lower level of well-being (Bryden, Dungen, Mayou, Peveler, & Neil, 2003; Ciechanowski, Katon, & Russo, 2000; Goldney, Phillips, Fisher, & Wilson, 2004; Jacobson, 1996).

Diabetes mellitus is a growing problem in the Western Pacific region and greatly impacts the quality of life (Western Pasific Declaration, 2008). By the year 2025, an estimated 60 million patients in the Western Pacific region will have diabetes, compared

with the estimated 30 million in 2000 (Western Pasific Declaration, 2008). As cited by Hau (2008), the Malaysian Diabetes Registry estimated that by 2030, Malaysia would have 2.48 million cases of diabetes, representing a 164% increase from the number of cases in the year 2000. However, according to the Obesity Prevention Council, Malaysia has exceeded that level in 2013 by 3.6 million cases of diabetes (The Star, 2013).

Therefore, lifestyle changes have resulted in an increase in the prevalence of chronic diseases such as diabetes. These changes can influence the individuals and their functioning in society. Thus, more research should be done in this area and an educational programme targeting this issue is greatly needed for patients with specific diseases such as diabetes. Such programmes could influence patients' attitudes towards their treatment and enable the design of more effective treatment plans.

Usually, psychological distress originates from chronic and acute stress and has a significant impact on the outcome of treatments given by health care providers (Peyrot & Rubin, 2007). Yet, there are only a few types of treatment that specifically address emotional and social components, metabolic control, and quality of life, and there are even fewer types of treatment that address all of these factors.

In Malaysia, there is no evidence of any intervention for adults suffering from type 2 diabetes which focuses on the psychological complications of diabetes and targets the patient's coping skills through individual cognition and behaviour (Debono & Cachia, 2007; DeVries, Snoek, & Heine, 2004; Edmunds, Roche, Stratton, Wallymahmed, & Glenn, 2007; Kramer, Ledolter, Manos, & Bayless, 2000). Researchers working on diabetes demographic factors and the level of knowledge among the diabetic population in Malaysia agree on the necessity for the development of an effective education strategy among this population (Tan, 2004; Tan & Magarey, 2008). Although research has been

done on psychological factors and diabetes, there is still insufficient scientific research specifically focused on the well-being elements and stress factors on diabetic patients in Malaysia. In one study done in Malaysia, the authors strongly recommended the need for introducing a diabetes strategy that relies more on the psychological complication of diabetes as well as the need to understand the patient's belief through self-management (Ali & Jusoff, 2009). This issue is of particular importance, especially when considering that diabetes distress and psychological well-being are often a co-morbid diagnosis for those with diabetes (Goldney et al., 2004). In addition, Cognitive Behavioural Therapy (CBT), which is a method of psychotherapy, has been adopted as a psychological treatment to decrease diabetes complications for diabetics in many societies outside Malaysia.

Group CBT has been a method that not only helps the participants benefit from being a part of group (e.g., cohesiveness), but also allows for a greater number of participants to be helped at the same time (Feifer & Tansman, 1999). Therefore, while there is evidence that group Cognitive Behavioural Therapy incorporating coping skills training is beneficial, this method of therapy has been thus far neglected for people with type 2 diabetes.

Based on the issues mentioned above, it can be concluded that the high prevalence of diabetes in Malaysia will continue for those who follow the average lifestyle in this country. Because of the psychological complications including depression, anxiety and stress among the patients suffering from diabetes, an appropriate intervention is needed to solve this problem. In spite of the good results obtained through CBT by researchers around the world, there remains a lack of such programmes among patients with diabetes in Malaysia.

## **1.7 Significance of the Study**

The present study is significant in a number of ways. First of all, it is important because the increase in the number of diabetics in Malaysia is likely to have serious consequences for the society as a whole. In fact, the growing number of cases implies that Malaysian society will have a considerable number of diabetics with emotional problems. These problems can impair the way that diabetics function within their home, workplace and in the society at large. Diabetics are a part of society and their psychological health is important. Therefore, the present study provides a deep examination of Malaysian participants who have had diabetes. With the help of an investigation on how psychological factors can affect the level of blood sugar, appropriate diagnosis and treatment methods could be discovered for the benefit of Malaysians with diabetes.

Second, this study is important because ageing and lifestyle changes are major contributors for the increase in diabetes cases in Malaysia (Zaini, 2000; Hasimah et al., 2011). In general, the majority of type 2 diabetics in the developing countries are of working age, between 40 and 60 years old (Shaw, Sicree, & Zimmet, 2010). In 1970, only 5.2% of the Malaysian population was over 65 years old. This percentage has been predicted to increase to 9.5% by year 2020, whereas, the life expectancy for males and females in 1970 was 61.4 and 64.7 years, respectively. The figures have been predicted to increase by year 2020, to 75.4 year for males and 80.4years for females. These factors will cause an estimated population increase to 33.7 million people by the year 2020, which will make Malaysia a place for a potential explosion of diabetes cases, so the need to study this issue is increasingly urgent (Zaini, 2000). The present study has focused

on the diabetes adult population and has considered age as an independent variable to explore more about the psychological complications for this specific age category and the effects of treatment on them.

Third, the present study on diabetics in Malaysia is important because Malaysia has three major ethnic groups with different cultures that provide a unique opportunity for research. A study conducted in Malaysia showed differences in glycemic control based on ethnicity (Ismail et al., 2000). One of the factors that has been examined in the current study is the comparison of the three major ethnic groups in terms of diabetes.

Fourth, the present study is important because it used instruments designed exclusively for diabetics. The Beck Depression Inventory (Beck, Ward, & Mendelson, 1961) is often used inappropriately on diabetics. Beck's Inventory measure includes items concerning weight loss, loss of libido, loss of appetite and fatigue, that are considered as symptoms of depression in the general population. However, such symptoms in diabetics are more likely to be associated with hyperglycemia, hypoglycemia, or other chronic complications of diabetes. When such a measure as the Beck Depression Inventory is used on diabetics, their symptoms can be diagnosed as psychological in nature causing them to visit psychiatric clinics, instead of directing their attention to improving their diabetes control. In the current study, the Well-Being Questionnaire (W-BQ 22) has been used, which measures anxiety, depression, and various aspects of positive well-being that are specifically related to diabetes complications. Also the Diabetes Distress Scale (DDS-17), which is used in the current study, has been developed to measure the level of distress only in diabetic people.

Fifth, this study is important because it attempted to highlight the efficiency of group CBT for treating diabetics. According to previous studies, an uncontrolled level of

blood sugar in diabetic people can lead to more and severe complications. In such cases, it is better to control blood sugar using group CBT, which could cut down long-term costly treatment for adults suffering from diabetes complications.

Sixth, this study is important because it has tried to fill the gap in the research on the efficiency of group CBT by making an association between stress and psychological well-being and diabetes. The treatment of diabetes for adults should incorporate and address the influence of psychological factors.

Finally, this study is important because it brings more attention to psychological complications of Malaysians who are suffering from type 2 diabetes. A number of organisations (such as Ministry of Health) and experts (counsellor, diabetologists or clinical psychologists) who are providing services to diabetics also benefit from the framework provided by this research and the outcomes.

### **1.7 Research Questions**

1. In people with type 2 diabetes, is there a relationship between stress and psychological well-being with blood sugar level?
2. Is group CBT an effective method for controlling blood sugar levels?
3. Is group CBT an effective therapy for decreasing distress among diabetics?
4. Is group CBT an effective therapy for increasing psychological well-being among diabetics?

### **1.8 Research Objectives**

1. To determine the relationship between stress, psychological well-being, and blood sugar level in people with type 2 diabetes.



2. To ascertain the effectiveness of group CBT on blood sugar control among people with type 2 diabetes.
3. To ascertain the effectiveness of group CBT on decreasing distress among people with type 2 diabetes.
4. To ascertain the effectiveness of group CBT on increasing psychological well-being among people with type 2 diabetes.

### **1.9 Research Hypothesis**

The hypotheses of the current study have been developed based on the theory of Cognitive Behavioural Therapy (CBT), group therapeutic approaches and the review of past studies related to psychological complications of diabetes (e.g., Lustman et al., 1998; Karlsen et al., 2004; Taylor, 2006; Peyrot & Rubin, 2007; Gonzalez & McCarl, 2010). These theories and studies are described in Chapter 2.

**Hypothesis 1.** There is a significant negative relationship between the level of psychological well-being and blood sugar level in participants before therapy.

**Hypothesis 2.** There is a significant positive relationship between the level of diabetes distress and blood sugar level in participants before therapy.

**Hypothesis 3.** There is no difference in the blood sugar level between the experimental and control groups before therapy.

**Hypothesis 4.** There is a significant difference in blood sugar level between the experimental and control groups, from before to after therapy.

**Hypothesis 5.** There is no difference in the level of diabetes distress between the experimental and control groups before therapy.

**Hypothesis 6.**There is a significant difference in the level of diabetes distress between the experimental and control groups,from before to after therapy.

**Hypothesis 7.**There is no difference in the level of psychological well-being between the experimental and control groups before therapy.

**Hypothesis 8.**There is a significant difference in the level of psychological well-being between the experimental and control groups,from before to after therapy.

### **1.10 Definition of Terms**

For greater clarity, the following statements provide conceptual definitions of the key terms that have been used throughout this study:

**Diabetes mellitus** is classified according to the clinical stages and aetiological types of diabetes and hyperglycemia (Gibir et al., 2000). Aetiological types include type 1 diabetes (defined as insulin-dependent diabetes mellitus), type 2 diabetes (defined as non-insulin-dependent diabetes mellitus), and other types. Type 1 diabetes is caused by the damage of pancreatic beta cells resulting from an autoimmune process of unknown aetiology which leads to insulin deficiency. Slight insulin resistance and relative insulin deficiency typically characterize type 2 diabetes. Type 2 diabetes may range from a major insulin resistance with relative insulin deficiency to a predominant insulin secretion defect with insulin resistance (Grey et al., 1998; Van der Does et al., 1996)

**Stress** can be defined as psychological, physiological and behavioural responses by individuals when they experience a lack of equilibrium between the demands they face and their ability to meet those demands or when they are faced with threats to their well-being (Lazarus, 1966).Lazarus's conception of stress led to the theory of cognitive

appraisal. According to Lazarus (1984), cognitive appraisal in stressful situations is divided in two stages: primary and secondary appraisal. In primary appraisal, when an individual faces a stressor s/he asks him/herself whether the threat is relevant to him/her. In secondary appraisal, an individual evaluates the resources and abilities he has for overcoming that stressful situation.

**Psychological well-being** refers to a “state of happiness, contentment, low levels of distress, overall good physical and mental health and outlook, or good quality of life” (VandenBos, 2007). According to Deci and Ryan (2008), psychological well-being is usually conceptualised as some combination of positive affective states such as pleasure (the hedonic perspective) and functioning with optimal effectiveness in personal and social life (the eudaimonic perspective). As summarised by Huppert (2009, p.137), “psychological well-being is about life going well. It is the combination of feeling good and functioning effectively.”

**Cognitive Behavioural Therapy (CBT)** is a type of psychotherapy which combines the theories of cognition and learning with techniques of treatment adopted from cognitive therapy and behaviour therapy. In CBT it is assumed that there is a relationship between cognitive, emotional and behavioural variables. The purpose of therapy is to determine and alter the client’s maladaptive thinking patterns and problematic behaviours through cognitive restructuring and behavioural techniques to achieve changes (VandenBos, 2007). In summary, it can be said that this approach links three suppositions: 1. Cognition affects behaviour. 2. Cognition can be monitored and alerted. 3. Behaviour change is mediated by cognitive changes. In fact, cognitive mediation of behaviour is the main aspect of treatment in Cognitive Behavioural

Therapy (Taylor, 2006). Group CBT is designed to address problems such as anxiety, stress, and depression. The goals are the same as in individual CBT with the power of the group added to help restructure the individual's thoughts, perceptions, and beliefs (White & Freeman, 2000).

## **CHAPTER 2 REVIEW OF LITERATURE**

### **2.0 Introduction**

This chapter will discuss three basic terms used in the current study: diabetes (specifically type 2), diabetes-related distress, and psychological well-being related to diabetes. The causes and consequences of diabetes are summarized according to previous studies and the psychological complications of type 2 diabetes for Malaysians are discussed. All psychologically relevant factors that can influence blood sugar control are explained and common psychotherapy methods used by researchers are introduced. CBT and its fundamental principles are discussed in another part of this chapter.

### **2.1 Diabetes**

During the final decades of the last century, there was a universal rise in diabetes mellitus, which has been described as “a growing global public health problem” and even a pandemic (Hjelm, Mufunda, Nambozi, & Kemp, 2003). It affects increasing numbers of people in developing and developed countries, across ethnic groups and socioeconomic classes (Langride, 2000). The number of people with diabetes around the world was estimated to be 30 million in 1985 whereas 135 million people with diabetes were reported in 1995 (Zaini, 2000). In 2005, over 190 million individuals were reported to suffer from diabetes around the world; by 2025 this number is predicted to reach 324 million with more than half of this increment occurring in Oceania (Cheng, 2005). The factors causing this rapid and widespread prevalence of diabetes over the

past four decades can be traced back to severe alterations in the human environment as well as in people's behaviour and lifestyle (Zimmet et al., 2005).

Both type 1 and 2 diabetes are related to the insulin hormone produced by beta cells in the pancreas; however, whereas in Type 2 diabetes, patients are able to produce insulin, those with Type 1 diabetes cannot do so (Kadowaki, 2000). Beta cells of those who suffer from type 1 diabetes are mistaken as foreign invaders (Langride, 2000) and thus are destroyed by the immune system in what is called an auto-immune response. Although the cause is unknown, research has uncovered relationships between type 1 diabetes and several factors influencing it, including oxygen free radicals, cow's milk, viruses, auto-antibodies and genetics (Langride, 2000). In the case of Type 2 diabetics, although insulin can be produced, the amount is either insufficient, resistant, or both. The result for all the above-mentioned problems is similar: glucose cannot reach the needy cells by insulin, so the blood contains a very high amount of extra glucose (Schulze & Hu, 2005). Type 2 diabetes accounts for 90% to 95% of all diabetes cases, and leads to insulin deficiency in those cases where it is not produced sufficiently for metabolic needs and muscle resistance (insensitiveness) to insulin (Alberti, Zimmet, & Shaw, 2006; DeCoster & George, 2005; Sarafino & Graham, 2006). Of the two types of diabetes, type 2 is the more predominant (Zimmet, Cameron, & Shaw, 2005), and in developed countries, is one of the commonest chronic diseases (Zimmet, Alberti, & Shaw, 2001).

Research interest in diabetes has been fuelled by the high costs of this disease to society in terms of disability, mortality, and healthcare (American Diabetes Association, 2008b). Research especially on type 2 diabetes (Lindahl, 2008) is deemed important as patients are two to four times more likely to develop cardiovascular and cerebrovascular

illnesses, and undiagnosed myocardial infarctions are three times more common in people with this illness (Piccini, Klein, Gheorghiade, & Bonow, 2004; Plahuta, 2004).

Given that the lifespan and lifestyle of people are undergoing great change, diabetes is predicted to become epidemic in Malaysia (Yun, Hassan, Aziz, Awaisu, & Ghazali, 2007), and this is corroborated by the fact that the prevalence of diabetes mellitus in the Malaysian population, specifically among adults, has increased from 0.65% in 1960 to 10.5% in 1996 (Mafauzy, 2006a). It has been observed that the prevalence of diabetes in Malaysia compared to estimates by the International Diabetes Federation (IDF) for other regions in the world is higher than the average rate (Letchuman et al., 2010).

In Malaysia, the First National Health and Morbidity Survey (NHMS 1) conducted in 1986 reported a prevalence of diabetes mellitus of 6.3% and ten years later, in 1996, the Second National Health and Morbidity Survey (NHMS 2) found that prevalence had risen to 8.2%. The WHO in 2000 has estimated that in 2030, Malaysia would have a total number of 2.48 million diabetics compared to 0.94 million in 2000, which means a 164% increase (Mafauzy, 2006b). As a matter of fact, the third National Health and Morbidity Survey (NHMS3) (2006) results have showed that Malaysia has already reached the projected prevalence for the year 2025. In addition, Dr Hilary King of WHO pointed out that there would be a projected rise of about 42% in developed countries, whereas the developing countries will see an escalation to the magnitude of 170% (Zaini, 2000).

The majority of people who are suffering from diabetes in developing countries such as Malaysia are aged between 45 and 64 years old, which is considered the working age group (Cockram, 2000). The prevalence of type 2 diabetes in those aged between 30

and 50 years in developing countries is also high in comparison with other countries (Cockram et al., 1993; Kim et al., 2006; Lu, Yang, Wu, Wu, & Chang, 1998; Takahashi et al., 2000).

The overall glycemic control in Malaysia was assessed in a study carried out by Ismail et al. (2000). The results indicated poor overall glycemic control with a geometric mean HbA1c of 8.6%, but fortunately, there is better control in type 2 diabetes (geometric mean HbA1c of 8.5%) compared with type 1 diabetes (geometric mean HbA1c of 8.9%). The same study also mentioned that one of the most important factors in controlling glycemia, which was more effective than interventions by medical nutritionists or diabetologists, was the availability of trainers to improve the education level of patients (Ismail et al., 2000).

Some of the most important problems are the lack of sufficient knowledge about diabetes in Malaysia, as well as the inability to obtain suitable treatment and preventive care (Ooyub, Ismail, & Daud, 2004). Accessibility to a diabetes educator who can work on patients' perceptions and their knowledge of their problem is deemed to be of higher significance than interventions by medical nutritionists or diabetologists. In fact, according to the Ismail et al. (2000) study in Malaysia, nurse educators at the Universiti Malaya Hospital and Malacca Hospital could control glycemia in the most optimum way, whereas Universiti Sains Malaysia (USM) Hospital, which lacks nurse educators but has three diabetologists, had the worst glycemic control.

Given that the prevalence of both types of diabetes mellitus in Malaysia are heading to a new phase of epidemic proportions, especially that of type 2, the National Diabetes Institute in Malaysia suggested that "what we need is to change the attitude" (Mustaffa, 2004). The reports of the Third National Health and Morbidity Survey in



2006 announced that although the attitude of the Malaysian public has changed and the public has gained in knowledge, these changes did not result in an alteration in behaviour. Although individuals might be aware of and recognise the significance of screening, they do not endeavour to screen (Letchuman et al., 2010). A change in attitude (and practice) and a stronger commitment are definitely required to stem the current trend.

## **2.2 Race/Ethnicity and Diabetes**

There are contrasting findings regarding the relationship between race/ethnicity, diabetes self-care, and glycemic control (Berkowitz, Lapinski, Wein, & Lee, 1992; Brown et al., 2005; Harris, Eastman, Cowie, Flegal, & Eberhardt, 1999; Nwasuruba & Egede, 2007). Although dietary factors, such as total caloric intake, relative excess of dietary saturated fats content and lack of fibers, together with reduced level of physical activity clearly determine the main features of the impact of lifestyle factors on diabetes, glycemic control appears to differ in various ethnic groups. Ethnic-related differences in lifestyle factors may account for some of the predisposition to diabetes of various ethnic groups, but genetic factors may play a more determinant role. It is well established that racial and ethnic differences exist in end-stage clinical outcomes for diabetic patients. Microvascular complications of the eyes, nerves, and kidneys and lower extremity amputations are more common in African- Americans, Hispanic Americans, and Native Americans with diabetes than in non-Hispanic Caucasian patients (Haris et al., 1999; Labery, Van, Ashry, Armstrong & Pugh, 1999). However, these end stage complications result only after a long duration of diabetes and thus occur in patients who were diagnosed and received much of their medical care many years ago. The current

contribution of the health care system to these racial and ethnic differences in adverse health outcomes versus the contributions of patient self-care practices and inherent biological and genetic factors is yet undetermined.

A number of other studies have shown that the prevalence of diabetes in the same ethnic groups is influenced by environmental factors. In a survey conducted in 1972 and 1973 in a small rural area of Japan, the prevalence of diabetes was found to be about 4% in the age group 40–69 years of Japanese ethnicity (Toyota, Kudo, Goto, Taya, & Komatzu, 1976). A slightly higher prevalence was found in Tokyo for the same ethnicity and age group (Kitazawa, Murakami, Goto, & Hamazaki, 1983). In subsequent surveys, the prevalence of diabetes among Japanese living in Japan has been shown to gradually increase (Kuzuia et al., 1992) but the same ethnic group has been found to have a higher prevalence of diabetes when living in Hawaii and in continental US, reaching over 21% in Japanese living in Seattle, WA (Kawate, Yamakido, & Nishimoto, 1980). Other epidemiological observations in Chinese Asians have shown similar impact on prevalence of type 2 diabetes. In 1979 through 1981, almost 40,000 people were screened in Beijing with 100 g OGTT and WHO diagnostic criteria for diabetes revealed a prevalence ranging from 2.3% to 9.7% in the various age groups (Zhi-sheng, 1983), higher than the prevalence recorded in rural China (Tay et al., 1986). Higher prevalence of diabetes has been observed for Chinese living in Hong Kong, Singapore, Taiwan, and Mauritius (Chou, Chen, & Hsiao, 1992; Cockram et al., 1993). Asian–Indians living in rural areas of India have a prevalence of diabetes of about 2%. Asian Indians living in urban India like areas of Madras have a prevalence of diabetes of about 8%. Asian Indians migrated to UK or other westernized countries, such as Singapore, have about four times higher prevalence of diabetes compared to those living in India (Dowse et al.,

1990; Ramachandran, Dharmaraj, Snehlatha, & Viswanathan, 1992). In the Philippines, the diabetes prevalence has been reported to be about 8–10% among adults. In 1982–1983, a national diabetes survey of 12,297 Filipinos aged 20–65 years was conducted in 44 randomly selected urban and rural communities in the Philippines (Azurin et al., 1984). The survey revealed a crude prevalence of diabetes of 2.5% in rural communities, 6.8% in urban areas, and 8.4% in the capital city of Manila. A recent study conducted among Filipino–Americans living in Houston, TX, the prevalence of type 2 diabetes was found to be about 16.2% (Cuasay, Lee, Orlander, Steffen-Batey, & Hanis, 2001).

The third Malaysian National Health Morbidity Survey in 2006, (NHMS III) stated that diabetes prevalence was the highest among Indians at 19.9%, followed by Malays at 11.9%, and Chinese at 11.4% (Mafauzy, 2006b). A study conducted on the level of primary healthcare in Malacca found that the Malay ethnic group formed the majority (54.6%) of diabetics, followed by Chinese (37.7%) and Indian (7.4%) (Chan, 2005). Another study was carried out in Malaysia by Ali et al. (1993) in order to verify the prevalence of diabetes mellitus between the two groups of Orang Asli and Malays who share the same physical features and reside in the same place. The study also intended to explore the association between dietary intake and nutritional status. The researchers found that diabetes mellitus was observed to be higher among Malays compared to Orang Asli, and this result was related to a more comfortable and better quality of life as well as modernization (Ali et al., 1993).

### **2.3 Age and Diabetes**

Type 2 diabetes occurs predominantly but not exclusively among middle-aged and elderly people (Olivarus, Andreasen, Keiding, & Mogensen, 1993). In Europe and the

USA, about 70% of patients who are diagnosed with diabetes are over 55 years of age. The average age at diagnosis in the above-mentioned countries is 60 (Shaw, Sicree, & Zimmet, 2010). The occurrence of type 2 diabetes increases with age in all populations. In Europe and the USA, diabetes typically affects 10% or more of people aged 70 and above (Shaw et al, 2010). Examining the actual prevalence of diabetes is difficult because many people in early stages of diabetes have few or no symptoms; therefore it is left undiagnosed (Cohen, Crosbie, Cusworth, & Zimmet, 1984; Rendell, 1983).

Although lately the age of people with diabetes has been decreasing and a tremendous surge in people under 30 years of age becoming diabetic has been noted, type 2 diabetes remains primarily associated with people aged 40 and older (Alberti et al., 2004; Katz & Abraham, 2006; Pavkov et al., 2007; Singh, Shaw, & Zimmet, 2004).

According to the American Diabetes Association (2004), among adults aged 20 to 39, the incidence of diabetes is 2.2%, and there is a 9.9% incidence among those aged 40 to 59. According to the same source, the incidence has risen to 18.3% among people of 60 and older. They also added that when pre-diabetes incidences are included, the percentage increases to 40%, which means almost 17 million elderly people have been diagnosed with or have a higher chance of being diagnosed with diabetes.

The association of psychological issues and age in diabetes has been proven. Yet, it has been revealed that the rate of middle-aged people having psychological problems is the highest (Peyrot & Rubin, 1997), and there are lower rates among the elderly (Connell et al., 1994; Haire et al., 1994). Many studies have consistently demonstrated a marked decline in metabolic control during adulthood and old age (Hoey et al., 2001; Mortensen & Hougaard, 1997). This decline is partly attributable to physiological changes during this time (Amiel, Sherwin, Simonson, Lauritano, & Tamborlane, 1986;

Hindmarsh, Matthews, Di Silvio, Kurtz, & Brook, 1988). According to previous research findings, it is usual for elderly people not to purchase their required insulin at all, but based on the pharmacies' reports, even those who buy insulin do not take the amount prescribed by their doctors (Piette, Heisler, & Wagner, 2004).

Several case studies, specifically on those who were diagnosed at a young age, showed that diabetes-related complications resulted in more anxiety and emotional burdens. Unsurprisingly, individuals with diabetes at early ages followed an appropriate therapy plan (Griffin, 1998; Olsen & Sutton, 1998).

People who are diagnosed with diabetes are vulnerable to diabetes complications. Although the chance of getting complications such as renal failure, loss of vision, infarctions, stroke, vascular disease, and neuropathy increases with age even among normal people, the prevalence and co-occurrence are exaggerated in people with diabetes. The presence of diabetes in an older adult increases the risks of adverse outcomes (Centres for Diseases Control and Prevention, 2011).

The first National Health and Morbidity Survey (NHMS) (1986) in Malaysia also emphasised on the role of age among diabetics in Malaysian society. The NHMS showed that the frequency of diabetes in 35-year-olds and older adults was 6.3% (Letchuman et al., 2010). After one decade, the second NHMS (1996) revealed a rise in frequency to 8.3% among the people in the same age range. This sudden increase caused the Ministry of Health of Malaysia to organize several national healthy lifestyle campaigns (Letchuman et al., 2010). However, according to the third NHMS (2006), the diabetes prevalence increased to a range of 20.8% - 26.2% in people aged 50 to 64 years.