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**HEALTH BELIEFS AND TREATMENT ADHERENCE AMONG MALTESE AND  
ANGLO-SAXON AUSTRALIANS WITH TYPE II DIABETES MELLITUS**



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adherence among Maltese and  
Anglo-Saxon Australians with

Dedicated to my Husband, Edwin, and my daughter, Jessica,  
and to my first family, especially my mother, Lilian

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## Abstract

There is a growing body of research examining psychosocial aspects of diabetes. Relatively few studies, however, have investigated a theoretical framework to help integrate empirical knowledge. This study tested the utility of an expanded health belief model for explaining regimen adherence among Type II Diabetes patients. Furthermore, the study examined differences between Maltese Australian people and Anglo-Saxon Australian people. A paper and pencil questionnaire was administered to 147 people with Type II Diabetes who attended Diabetes Australia in Sunshine, Western Metropolitan Melbourne. The questionnaire measured adherence to diabetes medication, dietary treatment adherence, adherence to home blood glucose monitoring, 'perceived susceptibility and severity of diabetes and its complications', 'perceived benefits and barriers to carrying out treatment', 'health locus of control', 'attitudes toward doctors', 'beliefs about food', and demographic factors. Health beliefs predicted dietary treatment adherence. There were predictive relationships found between health beliefs and ethnic differences were evident. A new 'Diabetes Dietary Adherence Model' emerged from the findings, which may assist in re-directing patient education programs.

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## 1 Introduction

Diabetes is an economic burden to the Australian community at large and the illness poses psychosocial challenges for the individual patient. People with diabetes, particularly those with complications, may face high costs such as lower quality of life, poorer cognition, functional restrictions in daily activities, more days of impaired physical and mental health, loss in work productivity, and a great deal more use of health services (Halh et al., 2002; Karlsen, 2002; Smith, & Page, 2001; Testa & Simonson, 1998; Valdmanis).

In most countries, diabetes consumes five to ten percent of the health budget (Gagliardino, Rhys, & Clark, 2000). In Australia, the cost of diabetes likely exceeds one billion dollars annually and by the year 2010 it is predicted that costs may be more than double this amount (McCarty, Zimmet, Dalton, Segal, & Welborn, 1996). The impact of psychosocial issues for a person with diabetes is a two-edged sword, in that it is possible for diabetes to lead to high psychosocial and economic costs, and also for poorer psychosocial health to lead to worse physical symptoms of diabetes and more economic costs (Ciechanowski, Katon, & Russo, 2000).

Diabetes Mellitus is one of the six Australian health priority areas (see the glossary section 6 for a definition of Diabetes Mellitus) (Australian Commonwealth Department of Health & Aged Care & Australian Institute of Health & Welfare, 1999). In particular the complications of diabetes, such as blindness, kidney dialysis and, limb amputations, can lead to poorer quality of life (Halh et al., 2002; Karlsen, 2002) and higher loss of potential years of life (Knuiman, Welborn, & Whitall, 1992). Diabetes was the underlying or associated cause of 18,982 deaths, or seven and a half percent of all deaths in Australia in 1997 and 1998. When diabetes was the underlying cause of death, the most prominent associated causes were complications of diabetes, such as coronary heart disease, renal failure, stroke, and heart failure (Gajanayake, Mathur, & Hodgson, 2000).

The prevalence of Diabetes Mellitus, particularly Type II Diabetes, is rising due to the aging population and increasing lifestyle risk factors such as obesity and inactivity (see the glossary section 6 for definitions of Type I and Type II Diabetes Mellitus) (Binns & Leong, 2000; De Looper & Bhatia, 2001). In affluent societies the prevalence of Diabetes Mellitus is currently in around three percent of the population,

totaling 554,200 individuals in Australia. Type II Diabetes accounts for approximately 80 percent of cases. Diabetes is likely to affect one and a half million Australians by 2010 (Australian Bureau of Statistics, 2001, pp. 4-5; McCarty et al., 1996). Worldwide, 300 million people will be affected by diabetes by 2025 (Seidall, 2000).

The prevalence of diabetes varies among certain countries and among particular ethnic minority groups (refer to the glossary section 6 for a definition of ethnic minority group). This may be due, in part, to cultural factors such as colonisation and migration, increased risk factors such as higher rates of obesity and lower socio-economic status, or a larger proportion of people who are aged in particular ethnic minority groups (Fujimoto, 1992; Ostbye, Welby, Prior, Salmond, & Stokes, 1989; Stanhope & Prior, 1980). For example, the prevalence rate of diabetes in Australia is estimated to be twice as high among those of culturally and linguistically diverse backgrounds, and two to four times as high among Indigenous Australians as for non-Indigenous Australians (Australian Commonwealth Department of Health & Aged Care & Australian Institute of Health & Welfare, 1999).

In a study of Malta-born Australians residing in Sunshine (Victoria), 9.3 percent of the sample had Diabetes Mellitus or impaired glucose tolerance, the state that precedes Type II Diabetes. A history of diabetes was present in 46 percent of first-degree relatives, parents or siblings, of the subjects with normal blood glucose (Martin, Hopper, Dean, Campbell, & Hammond, 1984). More recent studies report prevalence rates as high as 18 percent among Maltese people (Tuomilehto, Schranz, Aldana, & Pitkaniemi, 1994). Similar to American Indians, Australian Aborigines, Pacific Islanders, and people of third world countries, high diabetes prevalence in Maltese populations may be partly attributable to the transition in Malta from a largely rural society to a westernised society, through its history of colonisation (Prasad & Srivastava, 2002). Migration factors and the rapidly ageing Maltese population may exacerbate the problem of diabetes among Australian Maltese people (Fujimoto, 1992; Ostbye et al., 1989; Stanhope & Prior, 1980).

It is well established that the cost associated with diabetes complications is higher than daily treatment costs (Brown, Pedula, & Bakst, 1999; Diabetes Control and Complications Trials Research Group, 1996; Henriksson & Jonsson, 1998; Herman, Dasbach, Songer, & Eastman, 1997; Menzin, Langley-Hawthorne, Friedman,

Boulanger, & Cavanaugh, 2001; Testa & Simonson, 1998). For example, one of the largest inpatient costs of diabetes in Australia is cardiovascular and peripheral vascular disease at \$111 million per year. In comparison, pharmaceutical treatments for the daily management of diabetes, including insulin injections and oral agents, cost \$160 million annually (McCarty et al., 1996).

Empirical evidence demonstrates that the occurrence and progression of diabetes complications can be delayed or prevented through patient adherence to treatment regimens (Leslie & Pozzilli, 2002). Effective treatment involves a team of physical and mental health professionals and ongoing patient education (Armstrong & Harkless, 1998; Flemmer & Vinik, 2000; Gonder-Frederick, Cox, & Ritterband, 2002; Humphrey, Jameson, & Beckham, 1997; Nasr, Hoogwerf, Faiman, & Reddy, 1999; Rubin, Dietrich, & Hawk, 1998; Sadur et al., 1999; Stratton et al., 2000).

Improvement or maintenance of good blood glucose levels in Type I and Type II Diabetes has been demonstrated to greatly reduce microvascular complications and contribute to reduction in macrovascular complications (Tattersall, 1995a), however there remains a high prevalence rate of diabetes complications. It has been estimated that among persons in Australia with Type II Diabetes over 66 percent have at least one microvascular complication and 53 percent have at least one macrovascular complication (Australian Commonwealth Department of Health & Aged Care & Australian Institute of Health & Welfare, 1999; Phillips et al., 1998). Furthermore, the prevalence of diabetes complications and mortality caused by diabetes complications is higher among minority ethnic groups (Cappuccio, 1997; De Lissovoy, Ganoczy, & Ray, 2000; Fang, Manhavan, & Alderman, 1997). For example, mortality rates from diabetes in Malta-born Australians are higher than for Italy-born Australians and the general Australian population. Specifically Malta-born women are three times more likely to die from diabetes than Australia-born. Death rates from Ischaemic Heart Disease among Malta-born Australians are higher than for the general Australian population in nearly all age groups from 35 years (Martin et al., 1984).

The high prevalence of diabetes complications may be partially attributed to the low rates of adherence to treatment regimens among diabetes patients. A person who develops diabetes in adulthood needs to undergo major psychological and behavioural changes to effectively adjust to his or her treatment regimen (American Diabetes

Association, 1998; Cox & Gonder-Frederick, 1992). Even though patient education is promoted as a crucial aspect of diabetes treatment (American Diabetes Association, 1998) there are high non-adherence rates among diabetes patients, especially for dietary and exercise treatment (Delahanty, Simkins, & Camelon, 1993; Wood, 2002). Non-adherence rates for diabetes patients ranges from around 20 to 50 percent and non-adherence rates for people of minority ethnic groups have been found to be as high as 65 percent (Ary, Toobert, Wilson, & Glasgow, 1986; Bailey, 2000; Bruckert, Simonetta, Giral, & CREOLE Study Team, 1999; Greenstein & Siegal, 1998; Khoza & Kortenbout, 1995; Kurtz, 1990; Lee et al., 2000; Musey et al., 1995; Shoenfeld, Greene, Wu, & Leske, 2001; Ventor, Joubert, & Foukaridis, 1991). Moreover, published rates of treatment non-adherence among diabetes patients are most probably underestimates. This is because diabetes patients who decline an invitation to participate in research have been found to adhere less to treatment recommendations than patients who choose to participate in diabetes research (Riekert & Drotar, 1999).

Conducting medical research is vital to understanding the etiology and effective treatment of diabetes, while conducting psychosocial research is critical to educating patients about medical knowledge and treatment (Basler, 1995; Funke & Nicholson, 1993; Glasgow, 1997; Kok, Borne, & Mullen, 1997). Diabetes patient education programmes that address problematic beliefs and behaviours related to treatment have been shown to improve treatment adherence and health outcomes (Rubin, Walen, & Ellis, 1990). It is important, therefore, to understand the link between cognitions and diabetes treatment behaviour to assist patients to adjust to effective treatment plans (Brownlee Duffeck, Peterson, Simonds, Goldstein, Kilo, & Hoette, 1987).

There is a growing body of research that supports the effectiveness of education and counselling focusing on changing beliefs or attitudes to promote behavioural change among diabetes patients (Clark & Hampson, 2001; Halford, Goodall, & Nicholson, 1997; Pichert, Snyder, Kinzer, & Boswell, 1994; Stott, Rollnick, & Pill, 1995). This study, therefore, tests a revised health belief model for understanding the relationship between health beliefs and adherence to diabetes treatment regimens among Maltese and Anglo-Saxon Australians (see the glossary section 6 for definitions of health beliefs and the health belief model). This study contributes information to help fill the following gaps in empirical knowledge about diabetes.



- Over the past decade there has been an increase in psychosocial research into diabetes, however there is a dearth of research into diabetes treatment adherence models. There are also several studies that demonstrate the usefulness of the health belief model for explaining diabetes adherence, which provides a basis of comparison in the present study.
- The majority of research into diabetes treatment adherence focuses on the relationship between health beliefs and treatment behaviour. The present study, however, investigates the relationships between different health beliefs to further clarify the cognitions that underlie treatment behaviour that is adherent and nonadherent to medical recommendations.
- A number of diabetes studies focus on treatment adherence in relation to health locus of control, however few studies investigate patient beliefs or attitudes toward doctors and fewer still investigate patient beliefs about food. There are no published studies, such as the present study, focused on diabetes treatment adherence, the health belief model, health locus of control, attitudes toward doctors, and food beliefs (see the glossary section 6 for definitions of the main terms).
- There is a lack of such diabetes adherence research with minority ethnic groups in Australia, particularly with Maltese people. There have been biomedical studies into diabetes conducted with Maltese populations, however published psychological research regarding diabetes with Maltese people seems absent.

The aims of the present study were;

- To test a revised health belief model, which incorporates health locus of control, attitudes toward doctors and beliefs about food and their predictive relationship with adherence to treatment regimens among people with Type II Diabetes.
- To investigate the predictive relationships between different health beliefs among Type II Diabetes patients.
- To examine differences between Maltese Australians and Anglo-Saxon Australian patients on health beliefs and diabetes treatment adherence.
- To make recommendations for belief-focused, culturally appropriate patient education for people with Type II Diabetes.

The hypotheses were:

- Patient beliefs about treatment, beliefs about healthcare, and beliefs about the illness would be significant predictors of diabetes treatment adherence.
- There would be significant predictive relationships between patient beliefs about treatment, patient beliefs about healthcare, and patient beliefs about the illness
- There would be significant differences on health beliefs and diabetes treatment adherence between Maltese Australian and Anglo-Saxon Australian patients.

The remaining chapters of this thesis are organised as follows: Chapter 2 contains a review of the literature pertinent to this research, proposes gaps in empirical knowledge, and research questions of interest. Chapter 3 describes the research design and statistical analyses employed. Chapter 4 presents the results of the research and chapter 5 discusses the research results in relation to the relevant literature, contribution to empirical knowledge, implications and limitations of the study, conclusions are drawn from the findings and suggestions are put forward for further research directions. The glossary (chapter 6), reference list (chapter 7), and appendices (chapter 8) follow.

## 2 Literature Review

This chapter presents a review of the diabetes literature related to the research questions of interest in this study. The chapter is divided into five major sections. Section 2.1 identifies the major theoretical bases of the study. Section 2.2 examines the medical aspects of diabetes, including the importance of patient education and patient adherence to diabetes treatment. Section 2.3 is an outline of the literature pertaining to the psychology of diabetes for the purpose of highlighting the gaps in empirical knowledge addressed by this study. The section 2.4 provides empirical support for the diabetes adherence model tested in this study. It will review studies regarding health behaviour, treatment adherence, and ethnicity in relation to the health belief model, health locus of control, beliefs about food, and attitudes toward doctors (see the glossary section 6 for definitions of the main terms). Section 2.5 focuses on the two ethnic groups who participated in this study: Maltese Australian people and Anglo-Saxon Australian people. It emphasises Maltese and Anglo-Saxon cultural practices and beliefs related to health.

### 2.1 *Theoretical Underpinnings of the Study*

This section introduces the two branches of Psychology on which this study is based: Health Psychology and Cross-cultural Psychology. It briefly outlines theoretical issues that are pertinent to each field and to this thesis. It also provides definitions of key terms used throughout subsequent sections of the thesis.

#### **2.11 Introduction to Health Psychology and Cross-cultural Psychology**

This study is positioned within the domains of Health Psychology and Cross-cultural Psychology. A main aim of Health Psychology research is to understand the determinants and processes of change in health-related and illness-related behaviour in order to assist people to adopt healthy lifestyles. In the tradition of social psychology, a primary focus is upon the links between cognitions (beliefs, values, intentions, and attitudes) with behaviour (Allen, 1998; Antoni & Christensen, 2002).

In common with other Social Cognition models of health behaviour, the framework underlying this study is based on the assumption that cognitive processes underlie health behaviour. In contrast, alternative models suggest that healthy or

unhealthy actions influence cognition (McKnight & Sutton, 1994). The reciprocal links between cognitions and behaviour are complex and beyond the scope of this thesis, therefore to simplify interpretation of the study results, and to be consistent with wider social cognition frameworks, this thesis primarily focused on how cognitions may influence behaviour.

Another common assumption underlying theories social cognition is cognitive dissonance: that people are motivated to align one cognition with another simultaneously held cognition, and they also tend to align cognitions with overt behaviour (Corsini, 2002). However, some empirical findings suggest a weak link between cognitions and behaviour. Therefore, theories, such as the principle of compatibility, have been articulated to address this problem. The principle of compatibility is the notion that cognitions and behaviour should be measured at the same level of generality or specificity in order to detect a stronger relationship of cognitions to behaviour (Ajzen, 1996), for instance, investigating beliefs about the illness of diabetes in relation to diabetes treatment behaviour.

A main aim of research in Cross-cultural Psychology is to develop robust psychological theory that is relevant across different cultures. The challenge in Cross-cultural Psychology is to employ universal measures, which are relevant to several ethnic groups, yet sensitive to cross-cultural differences (Berry, Poortinga, Segall, & Dasen, 2002). To understand this important dilemma Etic and Emic theory will be discussed (Berry et al., 2002; Lock, 1981).

Many cross-cultural theorists make a distinction between the Emic and Etic approach. The former is focused on one culture and the study of behaviour from a position within the system, culturally-specific; while the latter is the study of many cultures from a position outside the system, culturally-universal (Berry et al., 2002). Thus the current quantitative, comparative study is necessarily of the Etic paradigm.

There is some controversy regarding Etic-Emic theory. Berry et al. (2002) argue that successful application of the Etic approach necessitates consideration of Emic viewpoints. Contrastingly, Lock (1981) suggests that the Etic approach compromises fundamental Emic assumptions.

When one proposes some basic universal dimensions from one cultural perspective and finds an apparent fit of other cultural systems to these dimensions, one has not proposed

universals at all. Rather one has constructed a translation and classificatory system which enables one to gain some understanding of an alien culture by locating elements of their systems within the hermeneutic circle of one's own (Lock, 1981, p. 184).

## 2.2 *Diabetes: A Medical problem*

This section defines the pathophysiology (section 2.21), diagnosis (section 2.21), typology (section 2.21), complications (section 2.22), and treatment (section 2.23) of Diabetes Mellitus. The section also includes a brief outline of the history of diabetes care.

### 2.21 Pathogenesis and Classification of Diabetes Mellitus

Aretaeus of Cappodocia (30 BC to 90 AD) wrote, “Diabetes is a...wasting-down of the flesh and limbs into urine...The cause is a common one, namely the kidneys and the bladder...” (Adams, 1856, p. 338). The first clinical description of Diabetes Mellitus was written by Aretaeus of Cappodocia who coined the term ‘diabetes’, meaning ‘to run through’ or a ‘siphon.’ ‘Mellitus’ means ‘honey’. Early descriptions of Diabetes included many of the major clinical manifestations, for example, traces of glucose in the urine, extreme thirst, and excessive urination (Chudley, 1999; Kosaka, 1994; Notelovitz, 1970). Early understandings of diabetes etiology were apt given its symptomology and complications, but bizarre in hindsight. For example, diabetes was attributed to dysfunctional kidneys (understandable given the effect of diabetes upon urinary patterns), overindulgence in carbohydrates (given the urinary excretion of glucose), melting flesh (excessive urination and weight loss), or a bite from a reptile (given the high susceptibility of diabetic persons to developing infections and slow healing) (Notelovitz, 1970). It was not until 1889 that Meiring and Minkowski demonstrated that diabetes is the result of pancreatic dysfunction, and then in 1921 Banting and Best discovered insulin treatment and the primary role of insulin in the etiology of diabetes (Bliss, 1982).

The hormone, insulin, is secreted from the Beta cells found in the Islets of Langerhans in the pancreas. The function of insulin is to regulate the production, storage, transport, and breakdown of carbohydrates, fats, and protein. After eating, insulin facilitates storage and transport of glucose (by-product of carbohydrate digestion), fatty acids (by-product of the digestion of fats), and amino acids (by-product

of protein digestion) and inhibits breakdown of ingested nutrients (Edwards, 1986). Insulin is particularly central to glucose metabolism.

Normally insulin secretion increases after a meal and initiates the following biological events. Glucose is converted to storage forms in the liver and fat cells, and there is an increase in the transport of glucose through the bloodstream into the muscle tissues, which is used for immediate energy or converted into stored forms of energy. Also, liver production of glucose is suppressed. However, in the diabetic state, insulin secretion is impaired, there is an increase in liver glucose production, reduced muscle glucose uptake, and resultant high blood glucose levels, hyperglycemia (Taylor & Aguis, 1988).

Overt symptomology of diabetes includes insatiable thirst, copious urination, excessive nocturnal urination, excessive appetite or food intake, and lethargy. People with diabetes may be more susceptible to infections (e.g., infections of the skin and thrush), they may experience cramps and sometimes blurred vision (sudden changes in blood glucose may effect the hydration of the lens causing alterations in refractive error) (Davidson, 1986; World Health Organisation, 1999).

Ancient physicians tasted the urine of their patients for sweetness to diagnose diabetes (Coleman, 1975). In diabetes, the increased filtered glucose load, secondary to high blood glucose levels, results in high urine glucose, glucosuria. In 1776 Dobson established for the first time that the sweetness found in the urine of a person with diabetes constituted a sugary matter, which originated in the blood (Notelovitz, 1970). By 1856, the presence of hyperglycemia was established as the main diagnostic characteristic of diabetes (Notelovitz, 1970).

According to the current guidelines set by the World Health Organisation and adopted in Australia, the diagnosis of Diabetes is established using one of the following three laboratory venous plasma glucose measurements. Any blood test must be confirmed on a separate day in an asymptomatic patient and urine tests are not adequate for the diagnosis of diabetes (Holmwood, Phillips, Harris, Ayers, & Colaguirri, 2000; World Health Organisation, 1999).

Diabetes may be diagnosed;

- 1) if the patient presents with symptoms of diabetes and the casual plasma glucose test result is over 11 mmol/L (casual refers to any time of the day regardless of time of last meal),  
or
- 2) if the patient's fasting plasma glucose test result is equal to or more than 7.0 mmol/L,  
or
- 3) if the patient's two hour plasma glucose test result is more than 11 mmol/L during an oral glucose tolerance test.

Diabetes Mellitus is a group of genetically and clinically heterogeneous disorders: Gestational Diabetes, occurring during pregnancy and resolving itself following childbirth; Impaired Glucose Tolerance, a state of impaired glucose regulation that may proceed Type II Diabetes; and the two primary idiopathic forms Type I Diabetes and Type II Diabetes. Type I Diabetes constitutes approximately 10 percent of diabetes cases, while Type II accounts for approximately 90 percent of cases in the United States and Australia (McCarty & Zimmet, 1994; McCarty et al., 1996).

Prior to the late 1980s, classification of Type I and Type II Diabetes Mellitus was determined by the severity (mild or severe, consecutively), age of onset (Juvenile-Onset or Mature-Onset), or treatment modality (Insulin-Dependent or Non-Insulin-Dependent). However, currently the classification of Diabetes is based on etiology, natural history, and clinical presentation (Orchard, 1994; Shaw, Zimmet, McCarty, & De Courten, 2000). General characteristics distinguish Type II from Type I Diabetes, however at present there are no practical specific markers for either group. For example, while Type I Diabetes occurs in the young it is by no means confined to that group (Molbak, Christau, Marner, Borch-Johnsen, & Nerup, 1994). Similarly, Type II Diabetes patients are normally overweight but some are normal weight (Holmwood et al., 2000; National Diabetes Data Group, 1979; World Health Organisation, 1999).

Type I Diabetes Mellitus is characterised by development of ketoacidosis in the absence of insulin therapy. When ketoacidosis occurs, insulin fails to shut-off fat breakdown consequently ketones, by-product of fat breakdown, increase and acidosis results (Kitabchi et al., 2001). Type I Diabetes is also defined by rapid onset,

manifestation in childhood, and recent weight loss (Holmwood et al., 2000; World Health Organisation, 1999). In contrast, Type II Diabetes Mellitus is defined by milder hyperglycemia, rare ketoacidosis, a slow onset, manifestation after 30 years of age, a strong family history of diabetes, and the tendency to be overweight (Holmwood et al., 2000; World Health Organisation, 1999). Type I Diabetes constitutes pancreatic Beta cell destruction and absolute deficiency of insulin secretion, whereas Type II Diabetes is characterised by impaired insulin secretion and impaired insulin action, insulin resistance (Reaven, 1983; Taylor & Aguis, 1988). Insulin resistance in Type II Diabetes is said to be present when higher insulin levels are needed to achieve a given biological action (Olefsky & Kolterman, 1981).

It has been demonstrated that Type I and particularly Type II Diabetes are partially genetically predetermined. People with a family history of Type I Diabetes are more likely to develop the illness and twin studies show concordance rates of up to 80 percent for Type II Diabetes (Barnett, Eff, Leslie, & Pyke, 1981; Littorin et al., 2001). However, the mechanisms whereby this abnormal gene, or genes, induce diabetes and how genetic make-up interacts with environmental factors are unknown (Knowler, Pettitt, Saad, & Bennett, 1990; Rotter, 1981). It has been found that Type I Diabetes is initiated in susceptible individuals by an autoimmune reaction to antigens of the islet cells of the pancreas (Norris, Dorman, Rewers, & Porte, 1987). Although the triggering event still remains a question, the development of Type I Diabetes has been linked to viral infections (Jenson, Rosenberg, & Notkins, 1980), exposure to chemical and diet toxins (Myers, Mackay, Rowley, & Zimmet, 2001), and cow's milk or lack of breastfeeding in infancy (Harrison & Honeymoon, 1999). Lifestyle risk factors such as physical inactivity and diet have been identified for Type II Diabetes (Feskens, 1992; King & Kriska, 1992; Patrick, Moy, & La Porte, 1989). For example, the conversion rate of impaired glucose tolerance to Type II Diabetes has been reduced by up to 18 percent with exercise and diet interventions (Melander, 1996). While research regarding the cure for diabetes continues (refer to section 2.311 for a discussion regarding psychosocial etiology), of equal importance are advances in treatment to prevent detrimental diabetes complications (Bonner-Weir et al., 2000).



## **2.22 Complications of Diabetes Mellitus**

The long-term microvascular (small blood vessel), macrovascular (large blood vessel), and neurologic complications of diabetes are similar for Type I and Type II Diabetes, except that macrovascular complications are more common among people with Type II Diabetes (Knuiman, Welborn, McCann, Stanton, & Constable, 1986; Morgan, 2000). Complications of diabetes include retinopathy (degenerative disease of the retina), nephropathy (disease of the kidney), neuropathy (nerve damage), coronary heart disease, cerebrovascular disease, and peripheral vascular disease. In addition to diabetic hyperglycemia, conditions that commonly co-exist with diabetes, such as hypertension and obesity, contribute to the development and progression of these complications (Eastman & Keen, 1997). The following is a description of the major diabetes complications and their physiological basis.

### **2.221 Etiology of Diabetes Complications**

Although the precise mechanism still remains a topic of controversy, it has been proposed that there are two major processes which link long-term hyperglycemia with blood vessel damage and diabetes complications: (1) The sorbitol pathway and (2) protein glycation.

1. In the diabetic state, when insulin levels are reduced or absent, glucose is metabolised using alternative means. Body tissue containing an enzyme, aldose reductase, converts glucose to a sugar-alcohol called sorbitol. Build up of sorbitol is found in body tissues of the kidney, eye, and nerves of diabetic animals and humans. The accumulation of sorbitol leads to tissue damage, because of impairment to metabolic processes within cells and excessive water sucked into body tissue (Greene, Lattimer, Ulbrecht, & Carroll, 1985; Stehouwer & Schaper, 1996).
2. Protein glycation occurs when glucose combines with proteins in the body and alters the properties of body proteins, increasing susceptibility to diabetes complications (Brownlee, Vlasara, & Cerami, 1984; Stehouwer & Schaper, 1996).

### **2.222 Retinopathy**

Retinopathy is the most important visual disturbance in persons with diabetes. Diabetes is responsible for 10 percent of blindness in Australia (Banks, 1981). Diabetes patients are also more prone than the general population to developing cataracts and glaucoma (Ederer, Hiller, & Taylor, 1981; Harding, Egerton, Van Heyningen, & Harding, 1993). Retinopathy is the presence of microvascular lesions in the retina, the inner most sensory layer of the eye (Hudson, 1996; National Health & Medical Research Council, 1997; Wilson, 1987). There is research demonstrating that chronic hyperglycemia leads to retinopathy in people with diabetes (Larkins, Dunlop, & Johnson, 1996).

In response to hyperglycemia, processes such as the sorbitol pathway and protein glycation (outlined in section 2.221) damage the blood vessel walls. The capillary walls weaken and dilate (microaneurysm formation) and may haemorrhage or leak. The leakage of fluids, fats, and proteins accumulates within the retina, leading to fatty deposits and thickening of the retina (macular oedema) (Hudson, 1996). This earlier stage is called Non-Proliferative or Background Retinopathy. Later, if the second Proliferative Stage of Diabetic Retinopathy develops, scarring and closure of vessels can take place and new abnormal blood vessels grow over the vital nerve cells, resulting in impaired vision or blindness (National Health & Medical Research Council, 1997).

### **2.223 Nephropathy**

Normally the kidney filters the blood and waste products are excreted as urine. The filtering structures in the kidney are called glomeruli, which are damaged as a result of diabetes. Diabetic nephropathy, or diabetic kidney disease, is a microvascular complication characterised by excessive protein leakage into the urine (proteinuria), thickening of the glomerular basement membrane (the filtration barrier), expansion of the mesangium (the central section of a glomerulus), loss of capillary filtration capacity, scarring, and blood vessel thickening (four to five times the normal thickness). Similar to retinopathy, in nephropathy blood vessel walls are damaged as a consequence of processes that take place in response to hyperglycemia, which leads to damaged glomeruli, a higher filtration rate (hyperfiltration), reduced quality of filtration, and

leakage of proteins through the capillary walls (Feener & King, 1997; Goetz, 1986; Mogensen & Schmitz, 1988).

Hyperfiltration and proteinuria are characteristic of early renal abnormalities. At this stage if blood glucose levels are normalized through effective diabetes treatment abnormal kidney function can be reversed. Once there is structural damage to the glomeruli, however, dysfunction is irreversible, proteinuria continues (clinical diabetic nephropathy) and late stage diabetic retinopathy may develop. At this final stage dialysis or kidney transplant is necessary for survival (Feldt-Rasmussen, Mathiesen, & Deckert, 1986; Mogensen & Schmitz, 1988). The natural history of nephropathy is better understood in Type I Diabetes, however in Type II Diabetes the onset of the disease is less definable. For example, a patient may present with end stage renal failure, or retinopathy, without ever knowing they have Type II Diabetes (Clements, 1985; Harris, 1992).

#### **2.224 Neuropathy**

Chronic hyperglycemia progressively leads to functional and structural changes to the nerves (Apfel, Comi, & White, 2000; Cameron & Cotter, 1997). Neuropathy is characterized by abnormal neural conduction within and between neurons due to structural and biochemical damage, such as reduced rate of sensory nerve conduction and thickening of intraneural blood vessels (Cameron & Cotter, 1997; Tesfaye, Malik, & Ward, 1994). There are three common types of neuropathy among diabetic patients.

- 1) Somatic sensory neuropathy is loss of sensation in the limbs, experienced as burning pain and numbness of the feet, the legs, and may involve the hands. Overt symptoms include neglected and excess callus, pressure areas, blisters and ulcers, and high risk of infection (e.g., gangrene) (Sugimoto, Murakawa, & Sima, 2000).
- 2) Sensorimotor neuropathy is damage to motor fibres mainly in the muscles of the feet. Symptoms include abnormal foot posture, and ensuing callus, blisters, and ulcers (Wunderlich, Armstrong, Husain, & Lavery, 1998).
- 3) Autonomic neuropathy is damage to the nerves leading to internal organs, such as those responsible for regulation of the heart rate or the bowel (Ewing, 1996).

Neuropathy mainly effects the legs and feet, but can effect internal organs and sexual organs. Damage to the lower limbs and sexual dysfunction, however, can also be

associated with blood vessel damage like that observed in retinopathy and nephropathy. Microvascular disease is present in the case of sexual dysfunction, and either microvascular (Benvenuti, Boncinelli, & Vignoli, 1993) or macrovascular disease can be present in the case of the lower limbs (Arora & LoGerfo, 1997).

### **2.225 Macrovascular Complications**

Macrovascular complications, such as coronary heart disease, cerebrovascular disease, and peripheral vascular disease, occur at an earlier age, greater severity, and worse prognosis in people who have diabetes compared to people without diabetes (Eastman & Keen, 1997). Thickening of the blood vessels (e.g., due to processes such as the sorbitol pathway and protein glycation) in the heart, brain, and lower limbs lead to a decrease in blood flow and may lead to blockages. For instance, blockages that occur in heart attack, stroke, or thrombosis (Stehouwer & Schaper, 1996). Features of diabetes, such as hyperglycemia (Hadden et al., 1997; Knuiman et al., 1986), altered platelet function (platelets are blood cells associated with clotting) (Vinik, Erbas, Park, Nolan, & Pittenger, 2001), and proteinuria (Winocour, Durrington, Ishola, Anderson, & Cohen, 1987), have been associated with the development of macrovascular complications in diabetes patients. Diabetes, however, is also an independent predictor of macrovascular disease (Tuomilehto, Birch-Johnsen, & Molarlus, 1997). Comorbidities in patients with diabetes, such as high cholesterol, high blood pressure, and obesity, increase the risk of developing macrovascular complications in diabetes patients (Donnelly, Molyneaux, McGill, & Yue, 1997; Eastman & Keen, 1997; Knuiman et al., 1986).

### **2.226 The Prevention of Diabetes Complications**

As evidenced by two major trials, the Diabetes Control and Complications Trial (DCCT) and the United Kingdom Diabetes Prospective Study (UKDPS), the risk of developing diabetes complications may be reduced or prevented by optimising metabolic control through adherence to an effective treatment regimen (Leslie & Pozzilli, 2002). In the DCCT trials, Type I Diabetes patients, who participated in intensive diabetes management had lower blood glucose levels and less microvascular complications (Flemmer & Vinik, 2000). The UKPDS study was conducted with a

sample of 4,209 Type II patients over a 14-year period (1977-1997). Patients assigned to the intensive therapy group had better glycemic control, a 25 percent risk reduction in microvascular complications, and a trend toward 16 percent lower incidence of myocardial infarction (Nasr et al., 1999). Furthermore, the UKPDS study showed that even a one percent reduction in glycated haemoglobin (HbA1c) was associated with 21 percent reduction in diabetes related deaths, a 14 percent reduction in myocardial infarction, and a 37 percent reduction for microvascular complications (Stratton et al., 2000).

### **2.23 The Management of Type II Diabetes Mellitus**

In the pre-insulin era, diabetes was understood to be a disorder of the metabolism therefore diet was the mode of treatment. Throughout history diets prescribed for patients with diabetes have been restrictive, at best, and, at worst, near to starvation was deemed necessary. In ancient times high carbohydrate consumption was recommended to replace what was thought to be lost in the urine. During the early 1900s, little amounts or total avoidance of carbohydrate was central to the diabetes diet, as diabetes was believed to be solely a disorder of carbohydrate metabolism. This involved fasting until the urine became glucose free, maintaining high protein and fat consumption to supplement energy levels, and then slowly increasing carbohydrate intake to determine carbohydrate tolerance (the maximum amount of carbohydrates that could be consumed before glucose was detected in the urine) (Tattersall, 1994).

In 1926 Sansum, Blatherwick, and Bowden (1926) saw that some diabetes patients refused to endure restrictive diets so they tested high carbohydrate diets and concluded that patients experienced no adverse effects. Unaware of the vital role of diet in the treatment of diabetes and faced with seemingly inevitable degenerative complications, other physicians of the 1900s encouraged free (choice) diets for people with diabetes. Eventually it was studies, like that of pioneer researcher Himsworth, that demonstrated the connection between high fat, low-carbohydrate intake, and reduced physical activity with increasing diabetes in affluent societies (Himsworth, 1949).

Currently there are two aspects of diabetes treatment, self-management and professional consultation. Self-management encompasses adherence to any prescribed medication regimen (e.g., tablets or insulin injections), regular home blood glucose

monitoring, adherence to a healthy diet recommended for those with diabetes, and regular physical activity. Professional consultation includes frequent physical examinations (e.g., regarding responsiveness to medication, blood glucose levels, blood pressure, cholesterol levels, kidney function, and vision), and ongoing patient education to update the patient's skills and knowledge about self-management tasks. Effective diabetes management is ultimately aimed at good health and a high quality of life. The physiological aims of effective diabetes management are to maintain blood glucose levels near to the normal range, normal blood pressure levels, normal cholesterol levels, normal energy levels, a healthy body weight, and prevention or early detection of complications (American Diabetes Association, 1998; Holmwood et al., 2000; Victorian Diabetes Taskforce, 1998). In this section all aspects of diabetes management will be addressed briefly for Type I Diabetes and more extensively for Type II Diabetes. The following information regarding diabetes management is in accordance with recommendations endorsed by the World Health Organisation, American Diabetes Association, and the Australian draft guidelines (Alwan, 1994; American Diabetes Association, 1998; National Health & Medical Research Council Advisory Committee, 2003).

### **2.231 Medication in the Management of Diabetes Mellitus**

The main difference between the treatment of Type I and Type II Diabetes is that, generally, Type I Diabetes is treated with adherence to diet and daily insulin injections, whereas Type II Diabetes is treated with adherence to diet and daily tablets or no medication. However, in many cases insulin injections or both tablets and insulin, are necessary for people with Type II Diabetes, and Type I Diabetes can sometimes be effectively treated with tablets (American Diabetes Association, 1998; Yki-Järvinen, 2000).

There are two major types of oral hypoglycemic agents, sulfonylureas and biguanides. Remembering that Type II Diabetes is characterized by deficient insulin secretion and action, sulfonylureas (e.g., Chlorpropamide, Glibenclamide, and Gliclazide) promote insulin secretion from the beta cells. In contrast, Biguanides (e.g., Metformin) decrease liver glucose production and increase peripheral, muscle, insulin sensitivity (Brown & Brillon, 1999; Edelman, 1998).

Hypoglycemic tablets are prescribed for Type II Diabetes patients who are unable to maintain blood glucose targets after dietary and exercise intervention over some given period, for example, three months, or perhaps a longer period of six months for people who are very obese. Tablets are introduced early if the patient presents with severe symptoms, very high blood glucose levels, or complications at diagnosis. When oral agents have been ineffective, insulin injections are introduced and in some cases combined with tablets (Holmwood et al., 2000; Victorian Diabetes Taskforce, 1998).

In the early years of insulin treatment it was believed that if blood glucose could be returned to normal levels there would be regeneration of pancreatic Islets and an increase in the natural production of insulin, hence, insulin administration was thought to cure diabetes (Percival, 1926). The first insulin was unmodified, now insulin is rigorously purified to reduce the level of contaminants between human and animal species, and to ensure that there are no bacterial remnants in human insulin (Babu & Khanna, 1999). Human insulin is the major insulin currently used in Australia, although insulin from cattle and pigs are available (Holmwood et al., 2000).

The type of insulin, short-acting (e.g., duration within 10 hours), intermediate (e.g., duration up to 24 hours), or long-acting (e.g., over 24 hours), is selected according to a patient's clinical profile and lifestyle. Type II patients often require one daily dose of insulin, if any, and people with Type I Diabetes need insulin two to three times daily. Insulin absorbs best if it is injected into the abdominal area, although the thigh, buttocks, or arm can be used. An alternative to insulin injections is the insulin pen. An insulin cartridge is inserted into the insulin pen like an ink cartridge, making it more portable and easier to administer. Insulin infusion pumps, for continuous administration, and automatic delivery systems, for those patients who have trouble injecting themselves, are also available (Holmwood et al., 2000). Research continues on new ways of administering insulin, such as inhalants (Cefalu et al., 2001).

The two major side effects of some hypoglycemic tablets and insulin are weight gain and hypoglycemia, excessively low blood glucose levels (Camacho, Pitale, & Abaira, 2000). Whether using tablets or insulin, regular eating and planned exercise are important to increase the predictability of blood glucose levels. During sickness tablets or insulin dosage may require adjustment, usually an increase in medication is needed.

### **2.232 Monitoring Blood Glucose in the Management of Diabetes Mellitus**

Prior to the 1980s, urine testing was the only home glucose monitoring method available. Currently, patients are advised to use a portable blood glucose meter (Tattersall, 1994). A single drop of blood is obtained from the finger or ear lobe and results are read on a reflectance meter. Self-monitoring of blood glucose levels, in consultation with a health professional, is an important part of diabetes management. During the early assessment period the patient tests and records his/her blood glucose levels three to four times daily. Once metabolic control is established, self-monitoring of blood glucose is reduced to once or twice daily, on two to three days of the week. Ideally, monitoring takes place before and after a meal, before and after physical activity, or at wake and sleep times. Self-monitoring of blood glucose levels facilitates the patient's understanding of diabetes and individual treatment effectiveness. Blood glucose records can assist the patient to become aware of his/her own response to different medication, foods, physical activity, and sickness. They can use this information to adjust their treatment schedule in consultation with a health professional (American Diabetes Association, 1994; Holmwood et al., 2000). Noninvasive self-blood-glucose-monitoring techniques are under investigation, but are not yet widely available (Klonoff, 1997; Roe, 1998).

### **2.233 Dietary Recommendations in the Management of Diabetes Mellitus**

The benefit of healthy eating for people with diabetes is three-fold. Appropriate eating assists with blood glucose control, weight management, and reduces macrovascular risk factors (Aronne, 2001; Schmidt, Rost, McGill, & Santiago, 1994). Excess dietary intake of energy dense foods, high saturated fat and refined sugars, and insufficient intake of complex carbohydrate have been linked to development of Type II Diabetes (Himsworth, 1949). A diet low-saturated-fat, high-complex-carbohydrate, and high-soluble-fibre is, therefore, advised for a person with diabetes. Generally, dietary recommendations for diabetes are the same as healthy eating guidelines for persons without diabetes, summarised in the healthy diet pyramid (Australian Commonwealth Department of Health, Housing & Community Services, 1993).

In the 1970's and 80s research was conducted into the affect of individual foods on blood glucose levels This research led to the development of Glycemic Index (GI),



the basis for health eating choices in diabetes. The GI factor is a method of measuring and comparing the blood glucose response to foods containing carbohydrate. A high GI indicates the food is rapidly digested and causes a rapid rise in blood glucose levels (e.g., peanuts, biscuits, and french fries). A low GI indicates the food is digested more slowly and brings about a slower rise in blood glucose (e.g., wholegrain breads, cereals, fruit, vegetables, and legumes). Multiple factors affect the GI factor, such as fibre content, fat content, type of starch present, the form of the food, its particle size, and the methods of food processing (American Diabetes Association, 1997; Jenkins et al., 1981).

Low GI foods help to moderate blood glucose levels in people with diabetes and if high GI foods are consumed with low GI foods there are less adverse effects on blood glucose (Bantle, Maine, & Thomas, 1986). However, some relatively low GI foods may have a high fat content (e.g., full cream milk), and a high GI food may be regularly included in the diet because of its high nutritional value (e.g., red meat).

### **2.234 Exercise and the Management of Diabetes Mellitus**

Physical inactivity plays a vital role in preventing Type II Diabetes and physical activity is an integral part of diabetes management (American College of Sports Medicine & American Diabetes Association, 1997; Himsworth, 1949; King & Kriska, 1992). Regular low-level aerobic exercise, within the person's ability, for at least a 30-minute period, three to four times weekly assists with weight management and metabolic control in diabetes (Holmwood et al., 2000; Victorian Diabetes Taskforce, 1998). In patients with Type II Diabetes, exercise increases the number of insulin receptors available on a cell membrane (in insulin-sensitive body tissue) and increases the sensitivity of the receptor to insulin (Wallberg-Henriksson, Rincon, & Zierath, 1998). Exercise also strengthens the heart and improves its efficiency, increases blood vessel penetration of the heart muscle, helps decrease blood pressure in mild hypertension, decreases cholesterol levels, and increases sense of well being (Wallberg-Henriksson et al., 1998).

Individuals with diabetes need to be aware of changes in their blood glucose levels in response to exercise, and the level or type of exercise appropriate for their particular physical condition. For example, those patients who take insulin or

sulfonylureas may be prone to developing hypoglycemia during or after exercise. Increasing carbohydrate intake and perhaps decreasing insulin before exercise may prevent a hypoglycemic event. Quick acting carbohydrates, such as jelly beans, should be carried during exercise to treat hypoglycemic events. Appropriate footwear and care of feet during exercise is essential. Resistance training and high intensity exercise is not advised for diabetes patients who have Proliferative Retinopathy or hypertension (American College of Sports Medicine & American Diabetes Association, 1997).

### **2.235 Professional Consultation and the Clinical Management of Diabetes Mellitus**

A patient with diabetes consults with multiple health professionals on a regular basis and depending on the individual's needs. Consultants include general practitioners, diabetes nurse educators, dietitians, podiatrists, ophthalmologists, and mental health professionals.

Effective diabetes clinical management involves regular physical examinations and testing of blood pressure, cholesterol levels, weight, urinary albumin (protein) excretion, and blood glucose levels. Glycated Haemoglobin (HbA1c) indicates the average blood glucose value over a six-to-eight-week period and fructosamine reflects the average blood glucose value over the preceding twenty-one-days (Cunningham, 2001). As well as professional consultation regarding home blood glucose monitoring, HbA1c and fructosamine laboratory blood tests are conducted preferably every three to four months (Holmwood et al., 2000; Victorian Diabetes Taskforce, 1998).

Regular professional consultation is needed regarding preventive behaviours, early detection, and effective treatment of diabetes complications. For example, eye examinations need to be carried out at diagnosis and are advised every one to two years. A professional should examine feet and discuss routine foot care (e.g., appropriate footwear, toe nails cut straight across with clippers, dry feet well after bathing) with the patient every six-month period. Ongoing assessments of renal and neural health need to be undertaken. Recommended time periods between each of the above examinations may vary, but these examinations are generally advised at least once annually (Holmwood et al., 2000; Victorian Diabetes Taskforce, 1998).

Diabetes patient education regarding the condition, the treatment, and its complications is a fundamental part of diabetes clinical management (American Diabetes Association, 1998). A person with diabetes needs to, at least, understand the practicalities of self-management in order to carry out the treatment regimen. Furthermore, adherence to treatment often requires a change from life-long beliefs and behaviours. There is a need to understand the psychosocial factors that may promote adherence to treatment regimens and strategies to prevent diabetes complications. Thus, psychosocial research, such as the current study, is integral to the implementation of new diabetes treatments and preventative strategies (Gonder-Frederick et al., 2002).

### *2.3 Diabetes: A Challenge for Behavioural Scientists*

#### **2.31 Overview of Research into Diabetes, Psychosocial Factors, and Patient Education**

The following section is an overview of psychosocial literature pertaining to diabetes, with the aim of positioning this study into a broader research context and to demonstrate the gaps in empirical knowledge addressed by this study. Research into the psychosocial aspects of diabetes stems out into three branches: Psychosocial etiology of diabetes (section 2.311), psychosocial outcomes (section 2.312), and psychosocial factors underling adherence to diabetes treatment regimens (section 2.313) (illustrated in figure 1). All three branches of diabetes psychosocial research will be outlined, with particular emphasis upon the third branch, the focus of this study. A summary of research into patient education and psychotherapy follows (section 2.314), in order to highlight the relevance of this study to the practice of diabetes healthcare.

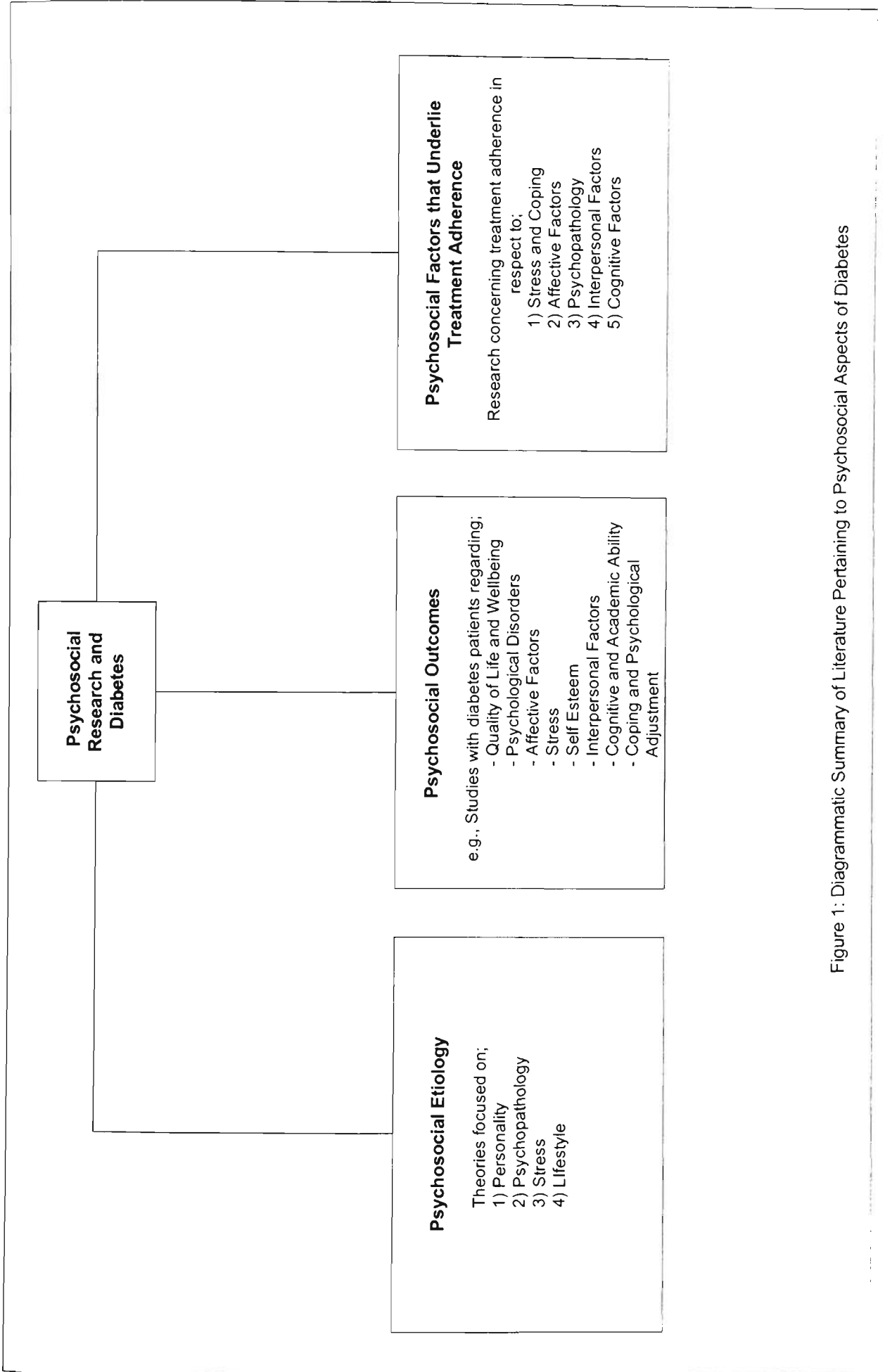


Figure 1: Diagrammatic Summary of Literature Pertaining to Psychosocial Aspects of Diabetes

### **2.311 Psychosocial Etiology of Diabetes**

The branch of diabetes research that deals with psychosocial etiology has four subdivisions: Theories on the subject of personality (section 2.3111), psychopathological conditions and medication (section 2.3112), stress (section 2.3113), and lifestyle factors or diabetes prevention programs (section 2.3113). Empirical findings for each subdivision will be discussed briefly, with more attention given to the lifestyle subdivision, due to its particular relevance to the current study.

#### **2.3111 Personality and Diabetes Etiology**

Until the early 1970's, personality theories, particularly those based on psychoanalytic thought, dominated psychosocial literature concerning diabetes etiology. These early theories sought the typical diabetes personality profile. The development of diabetes was attributed to unconscious psychological conflicts or wishes. For example, repressed infantile anxiety, frustrated hostility, or a paranoid aggressive trend. This was said caused by experiences of maltreatment or love deprivation, and said to be expressed as psychosomatic symptoms of excessive thirst, overeating, and/or a generally demanding nature (Cremerius, 1957; Cremerius, Elhardt, & Hose, 1956; Daniels, 1939; Meyer, Bollmeier, & Alexander, 1945; Rassidakis, Erotocritou, & Volidou, 1973; Schoeneich, 1953; Weinroth & Gerstle, 1953). More recent personality theories explaining diabetes etiology, generally, reject the earlier notion of a diabetic personality. They stipulate that certain personality factors, such as Type A personality, lead to high-risk affective or behavioural factors, such as high stress levels or poor coping strategies, which increase susceptibility to diabetes (Barron, 1978; Hu, Li, Lu, Bai, & Liu, 2001). Especially in retrospective studies, it is difficult to unravel psychosocial aspects of diabetes etiology from the psychosocial consequences of living with diabetes (Helz & Templeton, 1990).

#### **2.3112 Psychopathological Conditions, Medication, and Diabetes Etiology**

Prior to the late 1960s and continuous with the notion of a diabetic personality, researchers argued that the link between diabetes with psychological illness was based on the existence of psychological conflicts. They suggested that diabetes was caused by

psychological illness or that diabetes was a complication of psychological illness (Menninger, 1935; Van der Velde & Gordon, 1969). However, research following the 1970s suggested that anti-psychotic (e.g., Clozapine and Olanzapine) and anti-depressive (e.g., lithium) drug treatments underlie the development of diabetes in some people with psychological illness (Angrist, Gershon, Levitan, & Blumberg, 1970; Henderson et al., 2000; Korenyi & Lowenstein, 1968; Lahmeyer & Gaviria, 1980; Liebzeit, Markowitz, & Caley, 2001; Lindenmayer & Patel, 1999; Marinow, 1971; Mohan, 1999; Procyshyn, Pande, & Tse, 2000; Russell & Johnson, 1981). Recent research has also identified weight gain is a side effect of such medications and a diabetes risk factor (Wirshing, Pierre, Eyeler, Weinbach, & Wirshing, 2001). Other studies implicate shared etiological factors in the link between diabetes and psychological illness, such as neuroendocrinological disturbance (Eaton, 2002; Grandinetti et al., 2000; Holden & Pakula, 1999; Kinder, Kamarck, Baum, & Orchard, 2002; McEwen, Margarinos, & Reagan, 2002).

### **2.3113 Stress and Diabetes Etiology**

Since the 1940s there has been limited variation in the theories pertaining to diabetes etiology and stress. Empirical findings suggest that susceptibility to developing diabetes is associated with increased stress frequency, duration, intensity, and responsiveness to stress. The precise underlying mechanism remains an issue of controversy. For example, some researchers contend that behavioural stress responses, such as level of social support or overeating in response to stress, are underlying mechanisms; whereas others stipulate that physiological responses to stress, such as the effect on hormonal activity, the central nervous system, and blood glucose, are elements in the pathogenesis of diabetes (Bruch, 1949; Hinkle, Evans, & Wolf, 1951; Hong & Holmes, 1973; Ionescu Tirgoviste, Simion, Mariana, Dan, & Iulian, 1987; Kendall Tackett & Marshall, 1999; Lehman, Rodin, McEwen, & Brinton, 1991; Mirsky, 1948; Robinson & Fuller, 1985; Schoenecker, Heller, & Freimanis, 2000; Stein & Charles, 1971; Surwit & Williams, 1996; Yao, Gao, Gong, Zhou, & Luo, 2000).

### **2.3114 Lifestyle Factors and Diabetes Etiology**

Key psychosocial factors in the etiology of Type II Diabetes are diet and exercise behaviour (discussed previously in section 2.21), therefore of paramount importance to modern health policy is preventing diabetes (Wyshak, 2002). Preventative education programs are of interest in this study not only because many are designed to meet the needs of specific ethnic groups, but also because, unlike most patient education programs, they have a stronger focus on community beliefs and attitudes in relation to diabetes (Bjaeras, Ahlbom, Alvarsson, Burstroem, & Diderichsen, 1997; Carter Nolan, Adams Campbell, & Williams, 1996; Cook & Hurley, 1998; Gittelsohn, Harris, Burris, & Kakegamic, 1996; Hazuda & Monterrosa, 1997; Macaulay, Paradis, Potvin, Cross, & Saad, 1997; Ramirez, Villarreal, & Chalela, 1999; Teufel & Ritenbaugh, 1998; Western Region Health Centre, 2001).

For example, a preliminary study was conducted to explore causative explanations for diabetes with a Canadian Anishinaabe (Ojibway) community, to assist with designing preventative strategies (Garro, 1995). Findings of the study suggest that the Anishinaabe community preferred socio-environmental explanations (e.g., destruction of traditional way of life) for diabetes compared to explanations referring to individual dietary choice (viewed as blaming individuals). Studies, into diabetes prevention highlight the importance of cognitions in behavioural change and can be applied in diabetes patient care, because of the similarity between dietary and exercise preventative strategies and treatment regimen tasks.

### **2.312 Psychosocial Outcomes and Diabetes**

Psychosocial health outcomes (indicators), where psychological health is a legitimate end in itself, has only recently come to the forefront of diabetes research. It contrasts with research, such as the current study, that focuses on psychosocial health as a means to better adherence. Research regarding psychosocial health outcomes investigates psychosocial characteristics of diabetes patients, the effect of diabetes on patient psychosocial health, and adaptation to living with diabetes. Diabetes research of psychosocial outcomes encapsulates;

- Studies into quality of life and well-being (Bernbaum, Albert, Duckro, & Merkel, 1993; Hanestad, 1989; Jacobs, 2000; Puavilai, 1997; Sjoegren, Robeus,

- & Hansson, 1994; Upton, Bush, & Taylor, 1998; Wikblad, Leksell, & Wibell, 1996)
- Studies concerning psychological disorders, such as eating disorders (Antisdell & Chrisler, 2000; Aubry, Dalloz, & Stern, 1966; Brooks, 1984; Daniels, 2000; Forssman, 1955; Goldston, Kovacs, Ho, & Parrone, 1994; Rodin, Johnson, Garfinkel, & Daneman, 1986; Vila et al., 1999; Wilkinson, Borseley, Leslie, & Newton, 1987; Wing, Marcus, Epstein, & Blair, 1989)
  - Studies examining affective factors, such as depression, anxiety, and mood (Gonder Frederick, Cox, Bobbitt, & Pennebaker, 1989; Hose, Cremerius, Elhardt, & Kilian, 1955; Laederach Hofmann, Mussgay, Schill, & Rueddel, 2000; Littlefield, Rodin, Murray, & Craven, 1990; Lustman & Harper, 1987; Spirito, Ruggiero, Coustan, & McGarvey, 1992; Talbot, Nouwen, Gingras, Belanger, & Audet, 1999; Upton et al., 1998; Vila, Robert, Ch, & Vera, 1995; Wells, Rogers, Burnam, & Camp, 1993)
  - Stress research, examining stress as a consequence of diabetes (Daniels, 2000; Gilbert, Johnson, Silverstein, & Malone, 1989; Worrall Davies, Holland, Berg, & Goodyer, 1999)
  - Research regarding self esteem among diabetes patients (Bernbaum et al., 1993; Siarkowski Amer, 1997; Vila et al., 1995)
  - Research examining interpersonal experiences among diabetes patients (Alderfer, Wiebe, & Hartmann, 2002; Daniels, 2000; Landolt et al., 2002; LeMone, 1995; Schreiner Engel, 1985; Sullivan-Bolyai, Deatricks, Gruppuso, Tamborlane, & Grey, 2002)
  - Studies on the subject of cognitive and academic ability of people who have diabetes (Bent, Rabbitt, & Metcalfe, 2000; Dobrzanski & Rychta, 1968; Mekhtieva, 1966; Mooradian, 1994; Nilsson, Fastbom, & Wahlin, 2002; Ren, Fang, Jin, & Xu, 1999; Ryan, Vega, Longstreet, & Drash, 1984; Vanhanen et al., 1999)
  - Studies in relation to coping and psychological adjustment among people with diabetes (Band, 1990; Johnson & Carmichael, 2000; Karlson & Bru, 2002; Willoughby, 1996)



### **2.313 Psychosocial Factors that underlie Treatment Adherence**

Research focused upon determinants of treatment adherence is the branch of diabetes psychosocial research of main concern in this study. This branch can be divided into five main subdivisions: Stress and coping factors (section 2.3131), affective factors (2.3132), psychopathology (section 2.3133), interpersonal factors (section 2.3134), and cognitive factors (section 2.3135). According to the present framework, this study is categorised under the fifth subdivision, cognitive factors related to diabetes patient adherence to treatment regimens. A discussion of the research findings for each of the subdivisions follows.

#### **2.3131 Stress, Coping, and, Diabetes Treatment Adherence**

The majority of studies demonstrate a significant relationship between stress and negative coping strategies with lower patient adherence to diabetes treatment regimens and poorer patient health outcomes (Frenzel, McCaul, Glasgow, & Schafer, 1988; Goldston, Kovacs, Obrosky, & Iyengar, 1995; Goodall & Halford, 1991; Grant, Kyle, Teichman, & Mendels, 1974; Kutz, 2000; Rodin, 1983; Wang et al., 2000). Exposure to a stressful event has been shown to bring about short-term fluctuations in blood glucose in both people with and without diabetes, however the nature and extent of this effect differs between individuals and seems to be more pronounced in persons with diabetes (Goetsch, 1989; Goetsch, Wiebe, Veltum, & Van Dorsen, 1990; Hinkle & Wolf, 1952; Kramer, Ledolter, Manos, & Bayless, 2000; Wiebe, Alderfer, Palmer, Lindsay, & Jarret, 1994). In diabetes patients high stress, via its interaction with physiology and coping, has also been connected with treatment adherence and long-term metabolic control (Delamater, Kurtz, Bubb, White, & Santiago, 1987; Karkashian, 2000; Ruggiero, Spirito, Coustan, & McGarvey, 1993). The question remains as to whether the link between stress and metabolic control is do with physiological responses, such as autonomic system abnormalities, or to do with behavioural responses, such as poorer treatment adherence in response to stress (Aikens, Wallander, Bell, & Cole, 1992; Farrell, 2000; Hanson, Henggeler, & Burghen, 1987; Peyrot, McMurry, & Kruger, 1999; Spangler, Summerson, Bell, & Konen, 2001; Stenstroem, Wikby, Hoernquist, & Andersson, 1993; Sukiennik, 1962; Surwit, 1988).

### **2.3132 Affective Factors and Diabetes Treatment Adherence**

The association between mood alterations or changes in emotional state with blood glucose levels is unclear. In contrast, there is strong empirical evidence suggesting anxious and depressive feelings or disorders, are related to diabetes treatment adherence and metabolic control (Culpepper, 2002; Fexete, 2000; Koch & Molnar, 1974; Moses & Bradley, 1985; Rothbaum, Salas, & Heiss, 1992; Vieth, Hagglund, Clay, & Frank, 1997; Weissberg Benchell & Glasgow, 1997). Anxiety relates to poorer adherence and metabolic control (Eaton et al., 1992; Macrodimitris & Endler, 2001; McGrady & Horner, 1999; Puerto Suarez de Mendoza, Vaz Leal, Rayo Madrid, & Moreno Vazquez, 1994; Rempala, 1999). Diabetes patients with minor or major depressive disorders, depressive symptomology, or depressive feelings adhere less to diabetes treatment regimens, have higher levels of blood glucose, poorer metabolic control, and more diabetes complications (Daniels, 2000; de Groot, Anderson, Freedland, Clouse, & Lustman, 2001; de Groot, Jacobson, Samson, & Welch, 1999; Goodnick, 1997; Grandinetti et al., 2000; Kinder, 2001; Lustman, Griffith, Freedland, & Clouse, 1997; Miao, Chen, & Yao, 2000; Sensky, Meadows, Wise, & Thompson, 1996; Van Tilburg et al., 2001; Viinamaeki, Niskanen, & Uusitupa, 1995; Zauszniewski, Chung, Krafcik, & Sousa, 2001).

### **2.3133 Psychopathology and Diabetes Treatment Adherence**

Among diabetes patients, psychological disorders have been linked to low levels of treatment adherence, poor metabolic control, and diabetes complications (Cohen, Welch, Jacobson, de Groot, & et al., 1997; Khanna & Khanna, 1991; Kovacs, Goldston, Obrosky, & Iyengar, 1992; Lustman, 1988; Lustman, Griffith, Clouse, & Cryer, 1986; Maronian, Vila, Robert, & Mouren Simeoni, 1999). Eating disorders have been a central focus of research regarding psychopathology and diabetes patient adherence.

Empirical findings show that a diabetes patient who has an eating disorder (most often female) adheres poorly to her treatment regimen, because her pathological tendencies and misperceptions, concerning food, run counter to diabetes treatment recommendations. For example, diabetes patients with an eating disorder may miss meals, manipulate insulin dosage for the purpose of losing weight, and binge on unhealthy food (Affenito, 1996; Peveler, 2000; Powers, Malone, & Duncan, 1983). Studies indicate a high prevalence of eating disorders among diabetes patients and that

food beliefs play a role in this relationship, therefore, it may be useful to understand beliefs about food among diabetic populations to optimise treatment adherence (discussed further in section 2.45) (Cantwell & Steel, 1996; Herpertz, von Blume, & Senf, 1995; Pollock, Kovacs, & Charron Prochownik, 1995).

### **2.3134 Interpersonal Factors and Diabetes Treatment Adherence**

This body of research examines how diabetes treatment adherence is influenced by interpersonal relationships of patients with family, friends, work colleagues, schools peers, and health professionals. Examples are studies concerning diabetes adherence in relation to;

- Family conflict or cohesion, family stress and resources, and family functioning and structure (Auslander, Thompson, Dreitzer, & Santiago, 1997; Harris, Greco, Wysocki, Elder Danda, & White, 1999; La Grecca & Bearman, 2002; Overstreet, Goins, Chen, & Holmes, 1995; Waller, Chipman, Hardy, & Hightower, 1986)
- Parent-child intimacy, parental expressed emotion, and parental participation in the child's treatment regimen tasks (Crain, Sussman, & Weill, 1966; Grey, Davidson, Boland, & Tamborlane, 2001; Liakopoulou et al., 2001; Worrall-Davies, Owens, Holland, & Haigh, 2002)
- Spousal expressed emotion and spousal solicitous responding (Findley, 1999; Wearden, Tarrier, & Davies, 2000)
- Family perceptions of the health professional, the attachment between a patient and the health service provider, patient-provider communication, and the provider's style of healthcare (Ciechanowski, Katon, Russo, & Walker, 2001; Hanson, Henggeler, Harris, & Mitchell, 1988; Hunt, Arar, & Larme, 1998; Leonard, Kratz, Skay, & Rheinberger, 1997; Walker & Dudley, 2001).
- Attitudes and behaviour of school peers toward a person with diabetes (Fernandez Sierra, 1998; Mantani et al., 2000).

The majority of studies demonstrate that social support relates to treatment adherence, although the type, source, and level of beneficial social support may vary with an individual's age, gender, and ethnicity (Christensen, 1995; Connell, Fisher, &

Houston, 1992; Eriksson & Rosenqvist, 1993; Fisher, La Greca, Greco, & Arfken, 1997; Ford, Tilley, & McDonald, 1998; Goodall & Halford, 1991; Heitzmann & Kaplan, 1984; La Greca, Auslander, Greco, & Spetter, 1995; Sensky et al., 1996; Skinner, John, & Hampson, 2000). Generally, family members provide instrumental support and others (friends, school mates, or work peers) meet emotional support needs, especially in younger age groups (O' Dell Mccollum, 1997). There is also often an interaction between social support, stress, and treatment adherence (Griffith, Field, & Lustman, 1990; Ruggiero et al., 1993; Willoughby, 1996).

Most studies regarding interpersonal factors and regimen adherence investigate the influence of family factors on treatment adherence in children with Type I Diabetes. Not many studies are conducted with Type II Diabetes patients, and a relatively smaller number of studies examine the relationship between health professionals and patients. For a more detailed discussion in regard to patient perceptions of health practitioners and treatment adherence see section 2.46.

### **2.3135 Cognitive Factors and Diabetes Treatment Adherence**

Studies show that cognitive factors, such as attitudes and beliefs, are significant correlates of diabetes outcomes and treatment adherence (Bradley, 1995; Brownlee Duffeck, et al., 1987; De Weerd, Visser, Kok, & Van der Veen, 1990; Samuel Hodge, 2000; Skinner et al., 2000). The relationship between diabetes-related knowledge and patient adherence to treatment regimens, however, can be problematic. For example, Rempala (1999) found adolescents with Type I Diabetes had lower levels of adherence and poorer metabolic control than children with diabetes, even though they had more diabetes knowledge than their younger counterparts. Moreover, in a program evaluation study conducted by Wierenga (1994) with Type II Diabetes patients, diabetes treatment behaviour was the only variable that changed significantly following the patient education program, no change occurred in patient knowledge about diabetes. According to Hampson and Glasgow's (1996) findings, Type II Diabetes patients have more complex cognitions, regarding their illness than other chronically ill populations. It may be more useful to investigate other cognitive variables (e.g., beliefs or attitudes) shown to underlie adherent or nonadherent treatment behaviour.

### **2.314 Diabetes Patient Education and Psychotherapy**

Since the 1940s, patient education has been an integral part of diabetes treatment (Beaser, 1956). Although some empirical findings suggest that diabetes patient education programs about self-care lead to better adherence and physiological outcomes, the effectiveness of existing diabetes education models remains questionable (Leese, 1992; Norris et al., 2002). For example, research demonstrates that diabetes education programs may be successful in the short-term, but not over the long-term (Brown, 1992). Moreover Grier (1999) found the amount of patient education undertaken by patients was unrelated to diabetes treatment outcomes and adherence.

There is a plethora of modes and forms of diabetes patient education programs (Glasgow, La Chance, Toobert, & Brown, 1997; Howorka et al., 2000; Miller, 1998; Piette, Weinberger, & McPhee, 2000; Sarkadi & Rosenqvist, 1999; Wong, Seroka, & Ogisi, 2000). Despite the fact that research findings question the relevance of diabetes knowledge to treatment adherence, most diabetes education programs have a single insufficient goal, information transfer (Beeney, 1990; Coates & Boore, 1996; Goodall & Halford, 1991; Jenny, 1983; Myers & Midence, 1998; Nuryberg, Kreidler, & Weissler, 1996; Shillitoe, 1988; Spirito et al., 1993). Alterations in psychological outcomes, apart from increased patient knowledge about diabetes (e.g., changes in beliefs, depressive symptomology, and patient satisfaction), seem to be viewed as fringe benefits, rather than major vehicles toward the ultimate goal of improved adherence and metabolic control. The majority of existing patient education models are not designed to target change in these broader aspects of patient psychological health (Glasgow, Barrera, McKay, & Boles, 1999; Howorka et al., 2000; Piette et al., 2000).

For example, there are very few diabetes patient education programs that are based on the health belief model, despite the pragmatic nature inherent in its components (Clark & Hampson, 2001; Gillespie & Bradley, 1988; Stott, et al., 1995; Wdowik, 1998). Very few patient education programs, with the exception of ethno-specific programs (Hagey, 1989; Hendricks & Hendricks, 1994; Vazquez, Millen, Bissett, & Levenson, 1998), attempt to address any patient beliefs, even though addressing less than true beliefs may be essential to imparting accurate information about diabetes (Watts, 1980).

In the context of these questions, regarding the effectiveness of existing patient education programs, there seems to be a need to conduct further preliminary investigations into other psychological variables that may be stronger correlates to diabetes treatment adherence. Research, such as the current study, may re-direct the design of patient education programs.

In more recent years, psychotherapy has also become an option in diabetes care, to assist patients and their families cope with the difficult lifestyle changes and psychosocial challenges presented by the treatment regimen. A person with diabetes, who also has an eating disorder, an affective disorder, or a psychotic disorder, is particularly likely to seek psychotherapy (Feifer & Tansman, 1999). Several modes of therapy have been the focus of past studies, such as psychoanalysis (Moran, Fonagy, Kurtz, & Bolton, 1991), art therapy (Raghuraman, 2000), rational emotive therapy (Rubin, et al., 1990), support groups (face to face and internet-based) (Alley & Brown, 2002; Barrera, Glasgow, McKay, Boles, & Feil, 2002; Gilden, Hendryx, Clar, & Casia, 1992; Loader, Muncer, Burrows, & Nettleton, 2002; McKay, Glasgow, Feil, Boles, & Barrera, 2002; Oren, Carella, & Helma, 1996; Wysocki, Harris, Greco, Harvey, & McDonell, 1997), occupational therapy (Cate, Baker, & Gilbert, 1995), grief and crisis counseling (Edwards, 1987), goal setting (Glasgow, Toobert, Hampson, & Strycher, 2002; Webb, 2000), social skills training (Gross, Heimann, Shapiro, & Schultz, 1983), stress and anxiety management (Boardway, Delamater, Tomakowsky, & Gutai, 1993), relaxation and biofeedback techniques (Henry, Wilson, Bruce, Chisholm, & Rawling, 1997; Zhu et al., 2001), family therapy (Hakimi, 1998; Wysocki et al., 1997), cognitive behavioural therapy (Hains, Davies, Parton, & Silverman, 2001), and blood glucose awareness training (Lamparski & Wing, 1989). Many of these therapies have been found to be efficacious in the treatment of diabetes patients.

In contrast to patient education programs, the psychotherapeutic models investigated in diabetes research focus more on broader aspects of psychological health, such as beliefs and attitudes. However, psychotherapy for all diabetes patients is costly, therefore it may be useful to use psychotherapeutic models to inform development of patient education strategies. The success of cognitive and behavioural therapies in the treatment of diabetes patients, such as problem solving and motivational interviewing is

testimony to the usefulness of belief-focused diabetes research (Clark & Hampson, 2001; Halford, et al., 1997; Pichert et al., 1994; Stott et al., 1995).

## 2.4 *The Relationship between Health Beliefs and Diabetes Treatment Adherence*

### 2.41 **Diabetes Treatment Adherence and Existing Models**

Relative to the growing body of research examining how psychosocial variables determine regimen adherence, there is much less research aimed to generate or evaluate models of diabetes regimen adherence. A majority of this research is based on the health belief model (Bond, Aiken, & Somerville, 1992; Brownlee- Duffeck et al., 1987; Connell, Storandt, & Lichty, 1990; Palardy, Greening, Ott, Holderby, & Atchison, 1998; Samuel Hodge, 2000; Sensky et al., 1996; Skinner et al., 2000; Wdowik, 1998), which also forms the foundation of this thesis (refer to section 2.43). This section describes five major frameworks that have been used to explain diabetes regimen adherence in empirical literature: 1) theoretical frameworks focused on stress and coping, 2) behavioural frameworks, 3) family system frameworks, 4) cognitive-behavioural frameworks, and 5) cognitive frameworks. The health belief model belongs within the fifth cognitive framework.

1) Diabetes adherence models focused on stress and coping suggest that treatment adherence is associated with styles of coping, availability of psychosocial resources for dealing with stress, and/or physiological responses to stress (Murphy, Thompson, & Morris, 1997; Peyrot et al., 1999).

2) Behavioural frameworks include diabetes treatment models that primarily focus upon learning principles and behavioural patterns to explain adherence, such as the Relapse Prevention Model (Kirkley & Fisher, 1988; Simmons & Owen, 1992). For example, treatment adherence may improve by assisting patients to become aware of situational cues associated with unhealthy eating patterns (Schlundt, Stetson, & Plant, 1999).

3) Cognitive-behavioural frameworks encompass models of diabetes adherence based upon the stipulation that both treatment-related thoughts and behaviour are conditioned responses. For example, self-regulation models focus upon patient appraisals of their blood glucose level and their responses to low or high blood glucose levels. Self-regulation models suggest that adherence with treatment is dependent upon

accurate appraisals and reinforcement of appropriate responses (O'Connell et al., 1984; Urquhart, Kelly, Huey, & Summerbell, 2002; Wing, Epstein, Nowalk, & Lamparski, 1986).

4) Family system frameworks suggest that the patient's interactions with family, and/or the thoughts, feelings, or behaviours of other family members determine treatment adherence (Blechman & Delamater, 1993; Gerstle, 1999; Ott, 1997; Sarkadi & Rosenqvist, 2002).

5) Cognitive frameworks encompass diabetes adherence models focused on patient beliefs or perceptions in relation to diabetes regimen adherence, such as the health belief model discussed in section 2.43 (De Weerd et al., 1990; Hampson, 1997; Hampson, Glasgow, & Toobert, 1990; Nowacek, O' Malley, Anderson, & Richards, 1990; Palardy et al., 1998; Ruggiero et al., 1999; Sunday, Eyles, & Upshur, 2001; Weiss, 1998).

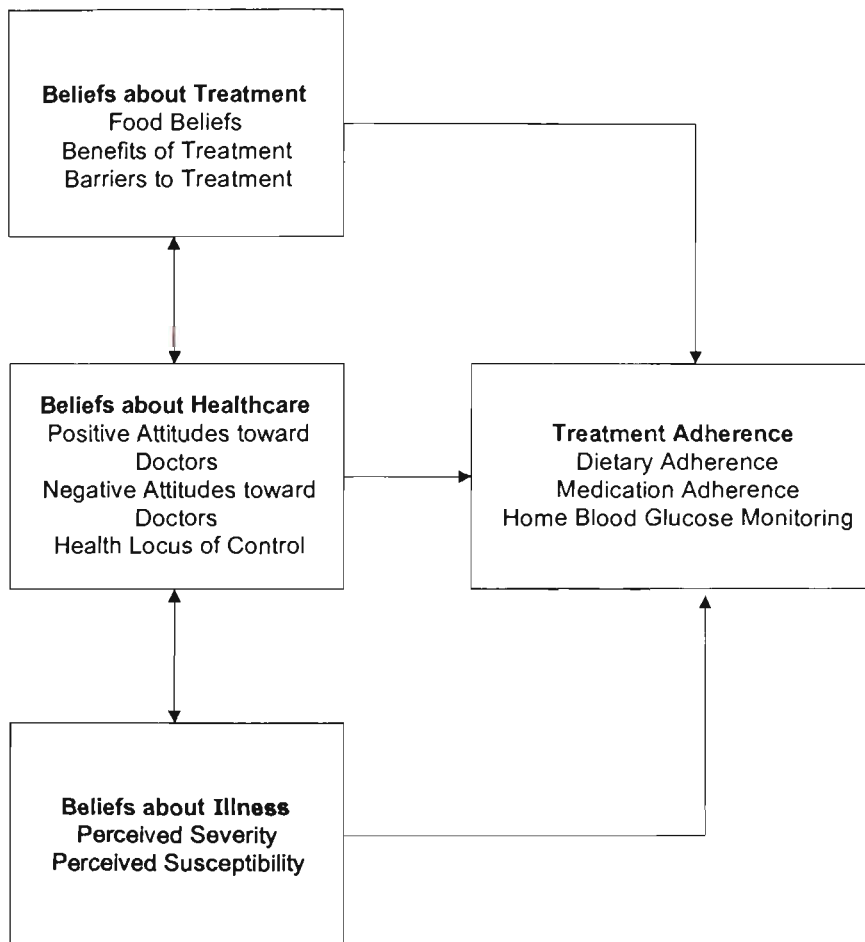
#### **2.42 Components of the Proposed Diabetes Adherence Model**

The diabetes adherence model under investigation in this study, is an expanded version of the health belief model. It includes health locus of control, beliefs about food, and attitudes toward medical doctors, in addition to the beliefs embedded in the health belief model. As can be seen in figure 2, the hypothesised expanded health belief model comprises of three sets of beliefs, which form the basis of subsequent discussion in section 2.4. The first set of beliefs about the illness consists of two beliefs from the health belief model: the 'perceived severity of diabetes' and the 'perceived susceptibility to developing diabetes complications' (see section 2.43). The second set of beliefs about treatment consists of three components: two beliefs from the health belief model, 'perceived benefits of and perceived barriers to carrying out diabetes treatment' (see section 2.43) and 'beliefs about food' (see section 2.45). The third set of beliefs about healthcare consists of two components: 'health locus of control' (see section 2.44) and 'attitudes toward medical doctors' (see section 2.46 about use of the term attitude).

The hypothesised model will be used to explain medication and dietary treatment adherence among Maltese and Anglo-Saxon people who have Type II Diabetes. Therefore, throughout this section each belief in the proposed model is considered in relation to ethnicity, medication adherence, dietary behaviour, and diabetes treatment



adherence. Moreover, in line with the aims of this study (see chapter 1), this section also reviews research relevant to the links between health beliefs that are incorporated in the proposed model.



**Figure 2:** Hypothesised Relationships between Health Beliefs and Diabetes Treatment Adherence

## **2.43 Beliefs about the Illness and Beliefs about Treatment: The Health Belief Model**

The following discussion outlines empirical findings in respect to the health belief model. There are four main sections. Section 2.431 presents a definition of the beliefs embedded in the health belief model and its theoretical development. The remaining three sections cover research concerning the health belief model in relation to medication adherence and dietary behaviour (section 2.432), ethnicity (section 2.433), and diabetes (section 2.434). The health belief model will also be the focus of later sections in this literature review, namely section 2.445 (in relation to ‘locus of control’), section 2.454 (relating to ‘food beliefs’), and section 2.466 (in relation to ‘attitudes toward doctors’).

### **2.431 Components, Origin, and Development of the Health Belief Model**

Rosenstock developed the health belief model (HBM) in the 1950s and 60s to understand the widespread failure of people to engage in preventative measures or screening tests for the early detection of asymptomatic disease (e.g., tuberculosis, cervical cancer, and dental disease) (Rosenstock, 1960, 1966, 1974). The model stipulates that the decision to engage in a healthy behaviour is based on the perceived effectiveness of that health behaviour to address a perceived health threat (Allen, 1998; Maddux, 1993). Becker, Drachman, and Kircht (1974) extended the HBM to explain adherence to medical treatments. For example, the revised model was first applied to examine health beliefs, of mothers, as predictors of adherence with regimens prescribed for their children (Becker et al., 1974). The HBM includes the following two components defined in relation to a person who has diabetes.

**Component One:** is the perceived health threat and comprises of beliefs A and B.

A) Perceived susceptibility to or a subjective view of one’s vulnerability to developing complications of diabetes.

B) Perceived severity or a subjective view of the seriousness of diabetes and its complications (Allen, 1998).

**Component Two:** is the perceived effectiveness of a health behaviour or treatment regimen and comprises of beliefs C and D.

C) Perceived benefits of the treatment behaviour to treating diabetes and preventing diabetes complications (addressing the health threat). An example is the perceived advantages of the regimen to reducing overt symptoms of diabetes.

D) Perceived barriers includes perceived personal, social, or financial costs involved in carrying out the treatment behaviour (Allen, 1998).

The HBM is one of the most extensively researched health behaviour models. The beliefs embedded in the model have been found predictive of various preventative, health maintenance behaviours, such as influenza inoculations, drink driving, physical activity, smoking behaviour, and breast self-examination. It has also been found predictive of treatment adherence among people with a chronic illness, such as persons who have hypertension, diabetes, and renal disease (Beck, 1981; Benedict, Goon, Hoomani, & Holder, 1997; Janz & Becker, 1984; Lai, Hamid, & Cheng, 2000; O'Brien Cousins, 2000).

According to the developers of the model, people engage in healthy behaviour when the health behaviour is perceived to be effective in addressing the perceived health threat. Therefore, high 'perceived severity of the health threat', high 'perceived susceptibility to the health threat', low 'perceived barriers to carrying out the health action', and high 'perceived benefits of carrying out the health action' were proposed as predictive of healthy behaviour (Rosenstock, 1960, 1966, 1974). Research shows, however, that the associations found between the HBM with behaviour have not always been in the predicted direction and not all the beliefs in the model have been found equally predictive of behaviour. As will be discussed in the following sections, empirical findings concerning the HBM vary according to behaviour under investigation, the ethnic background of participants, and their health status..

#### **2.432 Medication Adherence, Dietary Behaviour, and the Health Belief Model**

In this section, empirical findings regarding the HBM and adherence to medication will be contrasted with findings regarding the HBM and dietary behaviour. It will be suggested that the beliefs embedded in the HBM are predictive of medication

adherence, whereas only part of the HBM ('perceived effectiveness of the health behaviour') seems predictive of dietary behaviour. The current study addressed the gap in research with respect to the HBM, ethnicity, dietary behaviour, and medication adherence.

Previous research demonstrates that the HBM is applicable to medication adherence among people with chronic illness (e.g., sickle cell disease, hypertension, mental illness, and systemic lupus erythematosus) and among those without a medical condition (e.g., people taking medication to prevent malaria, adherence to medication among children who attended a pediatric emergency ward) (Abraham, Clift, & Grabowski, 1999; Adams & Scott, 2000; Brown & Segal, 1996a, 1996b; Budd, Hughs, & Smith, 1996; Elliott, Morgan, Day, Mollerup, & Wang, 2001; Hershey, Morton, Davis, & Reichgott, 1980; Kelly, Mamon, & Scott, 1987; Lin, Yang, & Lin, 1995; Soliday & Hoeksel, 2000). As expected, high 'perceived susceptibility to the health threat', high 'perceived severity of the health threat', high 'perceived benefits of taking prescribed medication', and low 'perceived barriers to adhering to prescribed medication' have been found predictive of medication adherence.

Few studies focus on cultural differences and medication adherence with respect to the HBM, however, there is evidence to suggest that the model is relevant to explaining medication adherence among people of different ethnic groups. For example, Lin, Yang, and Lin (1995) found among Chinese patients with Systemic Lupus Erythematosus the predictive factors for prednisolone non-adherence included the negative effects of prednisolone ('barriers/costs to taking medication') and 'perceived seriousness of the disease'. Additionally, Brown and Segal (1996a; 1996b) found White American patients with hypertension and African patients held different health beliefs, and that health beliefs predicted medication adherence. Studies regarding ethnicity, medication adherence, and the HBM also suggest that cultural beliefs (e.g., regarding physician-patient relations and present/future time orientation) were useful in the prediction of medication adherence when integrated with the HBM (Brown & Segal, 1996a, 1996b; Lin et al., 1995).

The majority of studies concerning dietary behaviour and the HBM have been conducted with people who do not have a chronic illness, investigating preventative health behaviour. For instance, there has been research into the HBM regarding dietary

recommendations for preventing cardiovascular disease and folic acid consumption among women prior to pregnancy to prevent neural tube defects (Hollis et al., 1984; Kloeblen, 1999; Kloeblen & Batish, 1999; Krummel, Humphries, & Tessaro, 2002; Liao & Zimet, 2000; Maiman, Becker, Kirscht, Haefner, & Drachman, 1977; O'Connell, Price, Roberts, Jurs, & McKinley, 1985; Quillin, Silberg, Board, Pratt, & Bodurtha, 2000; Ransford, 1986; Schafer, Keith, & Schafer, 1995). Many of these studies suggest that perceptions concerning the 'barriers to and benefits of healthy eating' are more predictive of dietary behaviour relative to 'perceptions of the health threat' (Hollis et al., 1984; Kloeblen & Batish, 1999; Krummel et al., 2002; O'Connell et al., 1985). These findings contrast with findings concerning medication adherence, which suggest perceptions of medication effectiveness ('perceived benefits and barriers') and perceptions of the health threat ('perceived susceptibility and severity') are both predictive of adherence to medication regimens (Abraham et al., 1999; Adams & Scott, 2000; Brown & Segal, 1996a, 1996b; Budd et al., 1996; Elliott et al., 2001; Hershey et al., 1980; Kelly et al., 1987; Lin et al., 1995; Soliday & Hoeksel, 2000).

Findings concerning the HBM in relation to dietary behaviour contrast with findings concerning the HBM in relation to medication adherence. This may be because the predictors of health behaviour among non-clinical populations (e.g., dietary behaviour) differ from the predictors of health behaviour among clinical populations (e.g., medication adherence). Or, this contrast may suggest that the predictors of lifestyle behaviour (e.g., dietary behaviour) are different from the predictors of adherence to regimen tasks (e.g., medication adherence).

There is a need to address the gap in research with respect to the HBM and adherence to dietary treatment among people who have a chronic illness. This research may assist in understanding how the cognitive determinants of medication adherence contrast with the determinants of dietary behaviour. There is some evidence to suggest the HBM is useful in predicting dietary behaviour among people of different ethnic groups (Krummel et al., 2002; Ransford, 1986), however, further research needs to be conducted in this area.

### **2.433 Ethnicity and the Health Belief Model**

This section is a discussion of the HBM in relation to ethnicity. Research supports the utility of the HBM for explaining health behaviour across different ethnic groups, particularly in respect to beliefs about ‘barriers to carrying out healthy behaviour’. Empirical findings will be presented to illustrate that ethnic groups differ with respect to the health beliefs embedded in the HBM. Finally, it will be proposed that expanding the HBM to include other culturally-relevant beliefs may assist with understanding ethnic differences in health beliefs and behaviour.

The beliefs embedded in the HBM have been linked to health behaviour across different ethnic groups, and the model has been found useful to identifying ethnic differences in relation to a wide array of preventative and treatment behaviour. For instance, health behaviours relating to HIV, AIDS, cancer (e.g., breast, prostate, skin, and oral), hypertension, diabetes, mental illness, drug addiction, and contraception have been investigated among Hispanic, African, Asian, White, and Black ethnic groupings (Brown & Segal, 1996a, 1996b; Falck, Siegal, Wang, & Carlson, 1995; Foxall, Barron, & Houfek, 1998; Hoeman, Ku, & Ohl, 1996; Hyman, Baker, Ephraim, Moadel, & Philip, 1994; Lai et al., 2000; Lin et al., 1995; Neff & Crawford, 1998; Pitts, McMaster, & Wilson, 1991; Ransford, 1986; Schwab, Meyer, & Merrell, 1994; Volk & Koopman, 2001). Research into the HBM is lacking with respect to Southern European groups and minority ethnic groups in Australia.

‘Perceived barriers to carrying out health behaviour’ have been linked to lower participation in healthy behaviour among people of various ethnic groups, such as Mexican American, Kenyan, Canadian South Asian, American Asian, African American, and Sri Lankan (Choudhry, Srivastava, & Fitch, 1998; Glanz, Resch, Lerman, & Rimer, 1996; Meana, Bunston, George, Wells, & Rosser, 2001; Rodriguez Reimann, 1997; Volk & Koopman, 2001; Yep, 1993). One of the most consistent findings in research investigating the HBM is that people of minority ethnic groups perceive more ‘barriers to carrying out healthy behaviour’ relative to people who are not of a minority ethnic group (Brown & Segal, 1996a, 1996b; Elder, Apodaca, Parra Medina, & Zuniga de Nuncio, 1998; Farooqi, Nagra, Edgar, & Khunti, 2000; Newton et al., 2001; Plowden & Miller, 2000).

Research, conducted with various ethnic groups supports a positive relationship between ‘perceived severity of and susceptibility to the health threat’ and participation in a healthy action (Pitts et al., 1991; Rodriguez Reimann, 1997; Yep, 1993). Similarly, research generally supports a relationship between ‘perceived benefits of carrying out a health action’ and engaging in that health action (Brown & Segal, 1996a, 1996b; Choudhry et al., 1998). However, there are studies conducted with minority, Eastern, or collective cultural groups, that suggest people who believe a health action has many benefits do not necessarily engage in that health action (refer to the glossary section 6 for a definition of collectivism) (Petro Nustas, 2001). In the same vein, some empirical findings suggest that perceiving a lesser ‘health threat’ can sometimes be linked to healthy behaviour (Volk & Koopman, 2001).

For example, McDonald, Thorne, Pearson, and Adams-Campbell (1999) found that African American women did not perceive themselves, or any particular racial or economic group, more susceptible to breast cancer. Moreover, they did not perceive breast cancer to be a fatal disease (‘perceiving low severity’). Overall, the African American women in the sample endorsed the benefits of mammography and denied the relevance of commonly cited barriers to breast cancer screening. The findings of McDonald et al. (1999) also showed that the ‘belief that breast cancer is not severe’ and perceiving less ‘barriers to performing tests to detect breast cancer’ relate to more frequent clinical breast examination among African American women.

Two, of many, possible reasons why people of different ethnic groups differ according to the beliefs embedded in the HBM will be discussed. First, people of particular ethnic groups may actually have less access to health information and services, therefore, they may be unaware of major health problems, illness prevention strategies, and medical treatments; thus illustrating a need for accessible health education (Elder et al., 1998). Second, people of different ethnic groups may have varied health beliefs because they have traditional health practices that are alternative to mainstream Western medicine (see the glossary for a definition of Western medicine); thus illustrating the need for culturally-appropriate health education (Hoeman et al., 1996; Lai et al., 2000; Schwab et al., 1994).

Much of the research into the HBM has only included ethnicity as a demographic variable, without also including other culturally relevant beliefs that may

assist in understanding ethnic differences (Hoeman et al., 1996; Lai et al., 2000; Schwab et al., 1994). For example, Brown and Segal (1996a; 1996b) found ethnic differences according to the HBM and that African Americans were more ‘present-oriented’ than White Americans. Similarly, a study by Jemmott, Maula, and Bush (1999) suggested that the ‘inability to talk with their sexual partners about condom use’, due to a cultural taboo surrounding sexual topics, was a ‘barrier to using condoms for preventing HIV/AIDS’ among Asian-Pacific Islanders.

#### **2.434 Diabetes and the Health Belief Model**

Empirical findings demonstrate that the beliefs embedded in the HBM account for some variation in level of adherence to diabetes treatment. This section will support the following four points: Relative to findings concerning ‘perceived susceptibility and severity of diabetes’, there is stronger empirical evidence to support a link between ‘perceived barriers to and benefits of carrying out treatment’ with diabetes regimen adherence. Past findings suggest that perceived treatment effectiveness varies with the type of regimen task (i.e., dietary, exercise, or medication). Studies are needed to clarify the relationship of ‘perceived threat of diabetes’ to treatment adherence, and also in respect to HBM, ethnicity, and diabetes.

‘Perceived benefits of and barriers to carrying out treatment’, separately and in combination (i.e., benefits minus costs), relate to regimen adherence and health outcomes among people with diabetes. ‘Perceived benefits of treatment’ and lower ‘perceived barriers to treatment’ relate to higher levels of treatment adherence and better health outcomes, such as improved metabolic control and well-being (Bond et al., 1992; Brownlee Duffeck et al., 1987; Connell et al., 1990; Palardy et al., 1998; Samuel Hodge, 2000; Sensky et al., 1996; Skinner et al., 2000; Wdowik, 1998). Furthermore, the relationship between ‘perceived benefits and barriers’ with regimen adherence has been found to differ with the form of diabetes, Type I or Type II, and the relationship also differs with the treatment task. For example, in a study conducted by Jenny (1986) ‘perceived benefits of carrying out diabetes treatment’ predicted adherence to the medication regimen among Type I Diabetes patients, but did not predict adherence to dietary and exercise treatment. In contrast, Jenny (1986) found in Type II patients



'perceived benefits of treatment' did predict exercise and dietary adherence (Jenny, 1986).

Studies suggest that the nature of 'treatment benefits and barriers' differs according to the treatment task under consideration. For example, Wakefield, Roberts, and Rosenfeld (1998) found that the recommended diet and weight control parameters for effective diabetes management were 'barriers to quitting' among diabetes patients who smoked. On the other hand, Tierney (1996) found diabetes patients did not perceive diet restrictions as a 'barrier to carrying out dietary treatment tasks'. Further study into 'perceived benefits and barriers to treatment' in relation to other beliefs, such as beliefs about food and health physicians, may assist in further understanding the nature of psychosocial obstacles to effective self care in diabetes patients.

The connection between 'perceived severity of diabetes' and 'perceived susceptibility to diabetes complications' with regimen adherence remains a topic of controversy. While some findings suggest that there is no such relationship (Skinner & Hampson, 1998), some studies suggest that high 'perceived threat' ('severity and susceptibility') motivates adherence (Dietrich, 1996), and other studies suggest that high 'perceived threat' leads to negative outcomes (Bond et al., 1992; Nagel, 2001).

There seems to be a dearth of diabetes research considering ethnicity in relation to the HBM. There are some findings, however, suggesting that 'perceived threat' and 'perceived treatment effectiveness' varies across ethnic groups (Wierenga & Wuethrich, 1995). Different cultural beliefs about 'family workload', 'the power of medicine', 'the fatality of diabetes', and 'personal control' have been linked to patient difficulties with carrying out regimen tasks and their concerns about the illness among particular ethnic groups (Halabi, 1997; Hunt, Pugh, & Valenzuela, 1998; Kozak, 1997; Walsh, 1999). Diabetes studies which add other culturally-relevant beliefs to the HBM may assist in understanding what motivates adherence to diabetes regimens. For example, in a study of Mexican American people with diabetes 'acculturation' and 'fatalism' were found to increase the cultural sensitivity of the HBM (Schwab et al., 1994).

#### **2.44 Beliefs about Healthcare: Health Locus of Control**

This section contains an overview of literature related to 'health locus of control'. It consists of six sections. Section 2.441 covers definitions of relevant terms and the theoretical development of the 'health locus of control' construct. Section 2.442

is a summary of empirical research regarding ‘internal and external locus of control’ in relation to health behaviour and adherence to medical regimens. Section 2.443 focuses upon ‘locus of control’ research concerning dietary behaviour and medication adherence. The next three sections review ‘locus of control’ literature regarding ethnicity (section 2.444), the health belief model (HBM) (section 2.445), and diabetes (section 2.446). ‘Locus of control’ will also be the focus of discussion later in this literature review in relation to ‘beliefs about food’ (section 2.455) and ‘attitudes toward doctors’ (section 2.467).

#### **2.441 Definition, Origin, and Development of Health Locus of Control**

Rotter (1966) coined the term ‘Locus of Control’ (LOC) based on social learning principles. LOC was conceived as an expectancy that a response will, or will not, influence the attainment of a reinforcement. A reinforcement is either perceived as contingent upon one’s own behaviour (‘internal LOC’) or not contingent upon one’s own behaviour, the result of chance, fate, or the actions of powerful-others (‘external LOC’) (Rotter, 1966). The items on Rotter’s Internal-External Control Scale are classifiable into six categories: academic recognition, social recognition, love and affection, dominance, socio-political beliefs, and life philosophy. However, the scale was not designed to assess LOC in any specific context. The scale measures a generalised belief about control that is presumed to effect control expectancies in a wide array of contexts, such as education, health, and work (Rotter, 1975).

Rotter’s (1966; 1975) LOC construct was uni-dimensional, with ‘internal LOC’ and ‘external LOC’ on the extremes of one continuum. This uni-dimensionality of the LOC construct has been since debated. For example, Levenson (1973; 1981) posited that external LOC is multidimensional. Levenson’s (1973) framework included ‘internal LOC’, (external) ‘powerful-others LOC’, and (external) ‘chance LOC’. ‘Powerful-other LOC’ is the belief that a reinforcement is contingent upon the behaviour of family, friends, or other significant persons. ‘Chance LOC’ is the belief that a reinforcement is dependent upon forces of fate or luck (Levenson, 1973). This multi-dimensional structure, specifically with reference to ‘external loci of control’, has led to the further understanding of LOC in clinical populations and differences between ethnic groups (see sections 2.442 and 2.444).

Based on the work of Rotter and Levenson, Wallston, Wallston, and DeVellis (1978) designed a domain-specific 'Health Locus of Control' (HLOC) measure. It is indicative of 'internal HLOC' and two types of 'external HLOC', 'powerful-others HLOC' and 'chance HLOC' (Wallston, Wallston, & DeVellis, 1978). The method section (3.242) contains a more detailed description of this instrument. HLOC refers to whether a health outcome is perceived as contingent upon one's own behaviour ('internal HLOC'), whether it is perceived as contingent upon the behaviour of family, friends, or health professionals ('external, powerful-others HLOC'), or whether a health outcome is perceived as dependent upon forces of fate or luck ('external, chance HLOC') (Wallston, Wallston, & DeVellis, 1978). Unlike LOC, HLOC is less stable over time and has been conceptualised as a belief, which can change as a result of altered health status or other important experiences. For example, experiences that can impact HLOC beliefs include diagnosis of diabetes, childhood socialisation within a particular ethnic community, or participating in a patient education program (Goldsteen, Counte, & Goldsteen, 1994; Wallston & Wallston, 1981; Winefield, 1982). If HLOC can change in relation to experience, then planned interventions may result in a change in HLOC.

LOC and self-efficacy pertain to perception of control, that is, a subjective estimation of the ability, or inability, to cause or influence something (Wallston, Wallston, Smith, & Dobbins, 1987). To facilitate discussion concerning the HBM and self-efficacy (included in section 2.445), the following definition is appropriate. Self-efficacy applies to a person's perceived ability to engage in a particular action or behaviour (behaviour-specific) in a particular situation (situation-specific) with a positive outcome (Bandura, 1977).

#### **2.442 Health Behaviour, Treatment Adherence, and Locus of Control**

This section reviews empirical findings that demonstrate a link between LOC with health behaviours and adherence to medical treatments, particularly contrasting clinical and healthy populations. It will be argued that 'internal LOC' is the healthier orientation according to research predominantly conducted with healthy populations, concerning preventative behaviour or health maintenance, and using uni-dimensional measures of LOC (Seeman & Evans, 1962; Strickland, 1978). According to research

conducted with clinical populations, concerning treatment adherence, and using multidimensional measures of LOC, 'powerful-others LOC' is also pertinent to engaging in healthier behaviour (Bourjolly, 1999; Christensen, Wiebe, & Lawton, 1997; Wallston & Wallston, 1981; Wallston et al., 1987; Wong & White, 2002).

An assumption illustrated by current healthy lifestyle campaigns and supported by research into seat belt use, birth control, weight control, exercise, dental health, and smoking, is that individual control of one's health, 'internal HLOC', is the more adaptive orientation (Chan et al., 2001; Gierszewski, 1983; Goldney & Cameron, 1981; Gregory, 1998; Kent, Matthews, & White, 1984; Morgan, Chapar, & Fisher, 1995; Norman, Bennett, Smith, & Murphy, 1998; Ozasa et al., 1995; Wallston & Wallston, 1978; Webb, Sanson Fisher, & Bowman, 1988). For example, a study conducted with 7,115 young adults demonstrated that the odds of engaging in a range of healthy behaviours, such as physical exercise, nutrient consumption, seat belt use, and smoking, are from 40 to 77 percent greater among individuals in the highest versus the lowest quartile of 'internal LOC' (Steptoe & Wardle, 2001b). In addition, Dalgard and Lund Haheim (1998) found that 'external LOC' was associated with increased mortality.

The linkage between healthy behaviour and 'internal LOC' has a compelling logic, however this link is not so relevant to clinical populations. For people who need to consult regularly with health professionals regarding health decisions a belief in the power of others over their health, 'external, powerful-others HLOC', may be of equal importance as 'internal HLOC' to maintaining good health (Bourjolly, 1999; Christensen et al., 1997; Levenson, 1973; McDonough, Boyd, Varvares, & Maves, 1996; Wallston & Wallston, 1981; Wallston et al., 1987; Wong & White, 2002). For example, Winefield (1982) found that men who recently suffered a myocardial infarction had significantly more 'powerful-others HLOC' than the non-clinical group. Additionally, Bremer Moore, Bourben, Hess, and Bremer (1997) found women with breast cancer had lower 'internal HLOC' and higher 'external HLOC'. Empirical findings also demonstrate that 'chance HLOC' is often associated with unhealthy behaviour, negative affect, and poorer health outcomes (Christensen, Moran, & Wiebe, 1999; Freeman, 1998; Gonzalez, 1997; Meyer, Sternfels, Fagan, Copeland, & Ford, 2001; Tak, 1998). For example, Jenkins and Burish (1995) found cancer patients participating in chemotherapy who had high beliefs in 'internal HLOC' showed declines

in 'negative affect' (depression, hostility, and anxiety) over time. Also, those cancer patients who believed highly in 'powerful-others HLOC' showed a decline in hostility over time, whereas those patients who had high beliefs in 'chance HLOC' experienced greater 'negative affect' over time.

Factor analytic studies of HLOC support this line of argument, in that a three-factor model of HLOC ('internal, powerful-others, and chance HLOC') seems more relevant to clinical populations. A two-factor model of HLOC is more appropriate to non-clinical populations (Coelho, 1985; Hartke & Kuncze, 1982; Russell & Ludenia, 1983). This is apparent in a study conducted by Talbot, Nouwen, and Gauthier (1996) contrasting concepts of HLOC among people with diabetes and people without diabetes.

Particularly relevant to HLOC in people with a chronic illness is the study of Wong and Sproule (1984). They coined the term "bilocals" to describe people whose beliefs fall in the middle of the 'internal-external LOC' continuum. Wong and Sproule (1984) suggested that bilocals cope effectively because they strike a balance between personal responsibility and faith in appropriate outside resources.

'External LOC', specifically 'powerful-others HLOC', has been linked with higher levels of adherence to medical regimens and health behaviours requiring professional advice or services (Aversa, 1996; Gregory, 1998; Lin & Liang, 1997; Raiz, Kilty, Henry, & Ferguson, 1999). By way of comparison, regimen tasks or preventative behaviours that call for more self-involvement have been linked to beliefs in 'internal HLOC' (Chen, Strecher Neufeld, Feely, & Sugg Skinner, 1999; Kent et al., 1984; Morrill, 1995; Steptoe & Wardle, 2001b). For example, Bundek, Marks, and Richardson (1993) found among elderly Hispanic women there was a positive relationship between 'powerful-others HLOC beliefs' and the recency of gynaecological screening, inclusive of physician breast examination. In contrast, there was a positive relationship found between 'internal HLOC beliefs' and carrying out self-breast examination. Moreover, in a large scale study conducted by Steptoe and Wardle (2001b), with a non-clinical cross-national sample, respondents who reported strong beliefs in 'powerful-others HLOC' were less healthy in terms of physical exercise, tooth brushing, seat belt use, and salt consumption.

### **2.443 Medication Behaviour, Dietary Adherence, and Locus of Control**

This section will present empirical findings suggesting that higher adherence to medication regimens is related to 'external HLOC', and that healthy dietary behaviour is linked to 'internal HLOC'. The following findings are continuous with the contention that preventative health behaviour (e.g., dietary behaviour) requires more patient responsibility, greater 'internal HLOC' beliefs, whereas treatment adherence requires more professional direction, greater 'external HLOC beliefs'.

One may assume that taking medication correctly over a long period of time and maintaining a healthy diet require a good deal of 'internal HLOC'. Although some research supports this assumption (Bazargan, Barbre, & Hamm, 1993; Budd et al., 1996; Cromer, Steinberg, Gardner, Thornton, & Shannon, 1989), numerous studies show alternative findings. Research carried out with clinical populations demonstrates a positive relationship between adherence to long-term medication regimens and 'external powerful-others HLOC', and show a negative relationship between 'internal HLOC' and medication adherence (Aversa, 1996; Beardsley, Johnson, & Kabat, 1982; Christensen et al., 1997; Lin & Liang, 1997; Wang et al., 2002). For example, Raiz et al. (1999) found among patients who had a renal transplant 'internal HLOC' and 'chance HLOC' was associated with a greater likelihood of postoperative medication non-adherence. Individuals who had more 'powerful-others HLOC beliefs' were more likely to adhere to the medication regimen.

In contrast to findings regarding medication adherence, studies concerning dietary behaviour suggest that 'internal HLOC' is linked to healthy dietary behaviour and 'external, chance and powerful-others HLOC' are linked to unhealthy dietary behaviour. For example, Norman and Bennett (1996) conducted a study with a representative sample of 11,632 people residing in Wales, and found healthy eating increased with 'internal HLOC beliefs' and unhealthy eating increased with 'external HLOC beliefs'. These linkages have been demonstrated in some studies concerning dietary behaviour in people who have a chronic illness (Patterson et al., 2003; Poll & De-Nour, 1980; Vives et al., 1999) and many studies have shown these results with people who do not have a chronic illness (Gettner, 1995; Goldney & Cameron, 1981; Hollis et al., 1984; Keltner, 1984; Kendler et al., 1991; Morrill, 1995; Rotenberg & Flood, 2000; Sparks, Shepherd, Wieringa, & Zimmermanns, 1995; Stone & Pangborn,

1990; Stotland & Zuroff, 1990; Williams, Chamove, & Millar, 1990). It seems there is a lack of HLOC research with people of various cultural groupings. One such study conducted by Ozasa et al. (1995) with a sample of 2065 people in Japan found that healthy eating, consumption of vegetables and fresh fish, was associated with 'internal HLOC'.

#### **2.444 Ethnicity and Locus of Control**

This section will review empirical evidence showing differences in LOC and HLOC between different ethnic groups. The nature and potential explanations for ethnic differences in LOC will be summarized. The discussion questions the assumption that 'external LOC' is always associated with negative outcomes.

The bulk of cross-cultural studies into LOC have been conducted with American populations, particularly investigating people of African American, Hispanic American, Indian American, and Asian American minority ethnic groups (Buchwald, Manson, Pearlman, Umali, & Kith, 1996; Hayes et al., 2000; Joiner, Perez, Wagner, Berenson, & Marquina, 2001; Smiley, McMillan, Johnson, & Ojeda, 2000). Few studies have compared people of North European background with people of South European origin, particularly in an Australian setting. Furthermore, more research is needed to investigate HLOC and ethnic differences, especially in relation to treatment adherence and other health beliefs.

#### **2.4441 Cross-cultural Differences in Locus of Control**

One of the salient results in LOC research investigating ethnic differences is that individuals who belong to collective cultural groups, minority ethnic groups, or Eastern ethnic groupings, on average, have stronger 'external chance or powerful-others LOC beliefs', relative to people of individualistic cultures, persons not of minority ethnic groups, or Western ethnic groups (refer to the glossary section 6 for definitions of individualism and collectivism) (Bachiocco, Credico, & Tiengo, 2002; Bjork & Lee, 1997; Borrayo & Guarnaccia, 2000; Furnham & Nordling, 1998; Gebhardt, van der Doef, & Paul, 2001; Levenson, 1981; Rimoldi, Raimondo, Erdmann, & Hojat, 2002; Sastry & Ross, 1998; Stanhope, 2002; Swinney, 2002; Wenzel, 1993). For example, Narayanan, Menon, and Spector (1999) found people from India held more 'external

LOC' beliefs in contrast to their American counterparts who held more 'internal LOC' beliefs.

Furthermore there are empirical findings suggesting that 'external LOC' beliefs may not be so clearly linked to negative outcomes among people of collective cultural groups, relative to research with people of individualistic cultural groups (Bjork & Lee, 1997). For example, a study by Mirowsky and Ross (1984) found a strong positive relationship between psychological distress (anxiety and depression) and 'external LOC' among Anglo-Saxon Americans; whereas there was a weaker positive relationship between 'external LOC' and depression among Mexican people. LOC was found unrelated to anxiety among people from Mexico and Mexican Americans. Mirowsky and Ross (1984) suggested that certain Mexican cultural beliefs or practices might have been linked to depression, possibly due to the emotional discomfort experienced with lack of individual control. However, it was suggested that the presence of strong social networks in Mexican ethnic communities might have relieved individual feelings of anxiety (Mirowsky & Ross, 1984). Parallel with the conclusions of Mirowsky and Ross, Narayanan et al. (1999) found the sources of work stress most frequently reported by Americans were workload and lack of control or autonomy because they had high 'internal LOC'. Contrastingly, the most frequently reported work stress among Indian participants was lack of structure or clarity because they had high 'external LOC'. It may be suggested that for collective cultures, such as Indian ethnic groupings, 'external LOC' is more highly valued and therefore more often expected (Weiz, Rothbaum, & Blackburn, 1984).

#### **2.4442 The Reasons for Ethnic Differences in Locus of Control**

There are two main streams of argument regarding the variables that underlie greater 'external LOC' among minority ethnic groups or collective cultural groups. One explanation is related to socio-economic status, and the second relates to collective and individualistic aspects of culture.

1) Specifically regarding minority ethnic groups, higher 'external LOC' may reflect actual lack of individual control related to socio-economic status. For instance, Galanos, Strauss, and Pieper (1994) found belief in 'chance and powerful-others HLOC' was predicted by race, education, and socio-economic level. Another example



is a study by Spalding (1995) contrasting African Americans and Hispanic Americans with Americans who were not members of any minority ethnic group. It was found that people of minority ethnic groups were more likely to believe in 'external HLOC', they exhibited poorer psychological adjustment, and were of a lower socio-economic status. It is difficult to disentangle the possible linkages between 'external LOC' beliefs, the socio-economic status of minority ethnic groups, and aspects of collective cultural life. Some research suggests that ethnicity and socio-economic factors interact in relation to LOC (Galanos et al., 1994; Hakeem, Thomas, & Badruddin, 2001; Spalding, 1995). Other studies show that variations in LOC between people of minority and majority ethnic groups are separate from the influence of socio-economic factors (Bremer et al., 1997; Eden, Kamath, Kohrs, & Olson, 1984; Wrightson & Wardle, 1997).

2) An alternative explanation for ethnic differences in LOC is as follows. It has been suggested that persons who pursue and exercise individual control within an individualistic culture experience success. In contrast, persons who seek and exercise individual control in a collective culture may be negatively sanctioned for placing self-interests before group needs, developing a stronger belief in communal control or 'external LOC'. They may even draw a sense of 'internal LOC' via 'external LOC' (Sastry & Ross, 1998). For instance, in a study conducted by Chia, Cheng, and Chuang (1998) it was found among Chinese people that the strongest relationship with 'internal LOC' was with 'family control' (a measure of family as the agency of control) and the next strongest was with 'other control' (indicating other people as the agency of control). On the contrary, among American participants the only significant relationship was between 'internal LOC' and self as the agency of control (Chia et al., 1998).

#### **2.4443 Ethnic Differences in Health Locus of Control**

This section contains literature pertaining to ethnic differences in HLOC. It proposes the usefulness of incorporating other culturally relevant beliefs into cross-cultural research regarding HLOC. This may assist in further understanding ethnic differences.

Generally, findings suggest that people of Western or individualistic cultures hold stronger 'internal HLOC beliefs' relative to persons of Eastern, collective, or minority

cultures who hold stronger 'external HLOC beliefs' (Aruffo, Coverdale, Pavlik, & Vallbona, 1993; Black, Markides, & Miller, 1998; Grieshop, 1997; Guinn, 1998; Spalding, 1995; Steptoe & Wardle, 2001a; Swimmer, 1997). However, in contrast to wider LOC research, empirical results relating to HLOC and ethnicity are less conclusive (Buchwald et al., 1996; Zeltzer & LeBaron, 1985). For example, Weitzel, Hudak, Becker, and Waller (1994) found Hispanic and Black persons differ on 'powerful-others HLOC', and consequently they questioned the common practice of assuming minority groups share similar LOC beliefs.

The mixed results concerning ethnicity and HLOC might be due to variation in health-related experiences, for example, the socio-cultural history related to traditional and Western medicine use in a particular country. Additionally, perhaps ethnic differences in HLOC are confounded by differences between clinical and non-clinical populations. For example, Bremer et al. (1997) found White, Asian and Black American women differed on HLOC beliefs and psychological adjustment when controlling for socio-economic factors. American women also differed on HLOC according to whether or not they had breast cancer (Bremer et al., 1997).

Most research in relation to HLOC has been interpreted in socio-cultural context, however, without explicit measurement of other beliefs (Black et al., 1998; Healy, 1997; Holroyd, Molassiotis, & Taylo-Pilliae, 2001; Stein, Smith, & Wallston, 1984; Wilson, Williams, Arheart, Bryant, & et al., 1994). For instance, Sun and Stewart (2000) found 'internal HLOC' associated with 'positive affect' in Hong Kong Chinese people with cancer. They concluded that 'internal HLOC' might have a similar positive impact on coping in collective cultures as in individualistic cultures (Sun & Stewart, 2000). No consideration was given to other health beliefs that may have provided the basis for an alternative explanation. By way of comparison, a study conducted with Caucasian, South Asian, and Afro-Caribbean women, controlling for health status, demonstrated that South Asian women scored higher on 'chance HLOC', 'powerful-others HLOC', 'internal HLOC', and religiousness (Wrightson & Wardle, 1997). It was concluded that people of South Asian background might have believed god influences health through circumstances ('chance HLOC'), through the self ('internal HLOC'), and through other people ('powerful-others HLOC'). Further research examining HLOC in relation to

ethnicity needs to consider the role of other health beliefs, in order to understand culturally-specific belief systems that may underlie ethnic variation in HLOC.

There have been some studies investigating how ethnicity and HLOC relates to psychological adjustment, however, an area lacking research is how HLOC beliefs and ethnicity relate to health behaviour, particularly regimen tasks among chronically ill populations (Bremer et al., 1997; Spalding, 1995; Sun & Stewart, 2000).

#### **2.445 The Health Belief Model and Health Locus of Control**

This section is an overview of findings with respect to the HBM and HLOC. Most research into the HBM and perceived control examines self-efficacy, therefore, studies into self-efficacy are included in the following discussion. Such research demonstrates that including self-efficacy improves the predictive power of the HBM (Aljaseem, Peyrot, Wissow, & Rubin, 2001; Black, Stein, & Loveland-Cherry, 2001; Carmel, Shani, & Rosenberg, 1996; Rosenstock, Stecher, & Becker, 1988). Apart from the work of Pender (Walker, Sechrist, & Pender, 1987), research investigating the HBM and HLOC is lacking, particularly in the area of treatment adherence, dietary behaviour and in relation to ethnicity.

Self-efficacy has been shown related to 'internal HLOC' (Aalto, Uutela, & Aro, 1997). For example, Kaplan, Atkins, and Reinsch (1984) found among people with more 'internal HLOC beliefs' self-efficacy related to healthier behaviour and better health outcomes. In contrast, among persons with more 'external HLOC beliefs' self-efficacy was unrelated to health outcomes. Findings concerning self-efficacy and the HBM may suggest that HLOC, specifically 'internal HLOC', is somehow linked to the HBM (Wallston et al., 1987).

The majority of studies consider the HBM solely in relation to behaviour and not the links between the HBM and self-efficacy (Rao, 1997; Webb et al., 1988). There is some empirical evidence, however, suggesting that self-efficacy relates to greater 'perceived susceptibility', 'perceived severity', and less 'perceived barriers to carrying out healthy behaviour'. For example, Adih and Alexander (1999) found among young men in Ghana low 'perceived barriers to condom use', high 'perceived susceptibility to developing the HIV infection', and high 'self-efficacy' interacted in the prediction of condom use. There is also similar evidence concerning the HBM and HLOC. For instance, a study conducted by Nemcek (1990) with Black women showed that low

‘powerful-others HLOC’ and low ‘perceived barriers’ were related to greater frequency of breast self-examination. Even though they measured different constructs, a study conducted by Katz, Meyers and Walls (1995) is also relevant here. They found that the best predictors of breast self-examination were ‘fear of developing cancer’ (potentially linked to ‘perceived susceptibility’) and self-rated ‘confidence concerning self-breast examination’ (potentially linked to ‘self-efficacy’ and ‘internal HLOC’).

Relative to research into preventative health behaviour, potential linkages between the HBM and HLOC are different with respect to medication adherence. ‘Internal HLOC’ seems linked to more ‘perceived barriers to medication adherence’ and less ‘perceived benefits of medication usage’. For example, Aversa (1996) found HIV positive individuals who intentionally omitted medication doses ‘perceived more barriers’ and had more ‘internal HLOC beliefs’ compared to patients who adhered to medication regimens. Likewise, Almarsdottir and Zimmer (1998) found ‘perceived benefits of medicines’ negatively relate to ‘internal HLOC’ among children.

In the light of the findings discussed in this section, it seems that more ‘perceived benefits’ and less ‘perceived barriers of a health action’ may be linked to ‘internal HLOC’ for preventive behaviours carried out by people themselves. For instance, self breast examination or dietary recommendations. For health behaviours or treatment regimens involving more professional involvement or direction (e.g., adherence to pharmaceutical prescriptions) more treatment effectiveness may be linked to lower ‘internal HLOC’ and possibly higher ‘external HLOC’. More research needs to be undertaken to understand potential associations between the HBM and HLOC.

#### **2.446 Diabetes and Locus of Control**

The following section reviews research concerning HLOC and diabetes. This section will demonstrate that HLOC relates to physiological indicators of diabetes management (e.g., metabolic control) and regimen adherence. It will also be shown that, although results are inconclusive, both ‘powerful-others HLOC’ and ‘internal HLOC’ have been associated with positive outcomes among diabetes patients. ‘Chance HLOC’ have been found associated with negative diabetes outcomes. Empirical findings regarding HLOC beliefs and dietary treatment of diabetes will be contrasted with findings regarding HLOC beliefs and pharmaceutical treatment of diabetes. Moreover,

HLOC among diabetes patients will also be discussed in respect to ethnicity and the HBM.

There has been a considerable amount of research conducted to investigate issues of perceived control and responsibility in treatment among Type I Diabetes patients, especially with children, adolescents, and their parents (Allen, Tennen, McGrade, Affleck, & Ratzan, 1983; Anderson, Auslander, Jung, Miller, & Santiago, 1990; Bennett Murphy, Thompson, & Morris, 1997; Brand, Johnson, & Johnson, 1986; Burns, Green, & Chase, 1986; Hanson, Henggeler, Rodrigue, Burghen, & Maurphy, 1988; la Greca, Follansbee, & Skyler, 1990; Reid, Dubow, Carey, & Dura, 1994; Swift, Seidman, & Stein, 1967; Waller et al., 1986). These studies, however, will be excluded from the following discussion. They demonstrate how important it is to tackle issues of perceived control for effective diabetes management, however, the focus upon developmental (e.g., adolescence versus pre-adolescence) and parenting (e.g., parental nurturance and the child's dependency or independence in adolescence) issues are irrelevant to this study.

Empirical findings concerning the relationship between HLOC and diabetes adherence are mixed. However, the assumption that effective self-management of diabetes requires a belief in 'internal HLOC beliefs' seems inherent in current patient education programs (Anderson & Genthner, 1990; Basler, 1995; Duchin & Brown, 1990; Van Den Arend, Stolk, Krans, Grobbee, & Schrijvers, 2000).

Some empirical findings support this assumption, demonstrating a positive relationship between 'internal HLOC' with desirable diabetes outcomes. For instance, 'internal HLOC' has been found related to positive patient attitudes, fewer diabetes complications, good metabolic control, and regimen adherence, while 'external HLOC' related to undesirable diabetes outcomes (Aikens, Wallander, Bell, & McNorton, 1994; De Weerd et al., 1990; Peyrot & McMurry, 1985; Schwartz, Coulson, Toovy, Lyons, & Flaherty, 1991; Spangler et al., 2001). There is research suggesting alternative relationships. For example, it has been found that 'internal HLOC' and 'powerful-others HLOC beliefs' are both linked to better diabetes outcomes (Rodin, 1983; Schlenk & Hart, 1984), and that 'chance HLOC' beliefs relate to negative outcomes (Stenstrom, Wikby, Andersson, & Ryden, 1998).

Other diabetes studies suggest ‘external HLOC beliefs’ are stronger among Hispanic, African American, and Haida (British Columbian) communities and related to poorer psychosocial outcomes (e.g., poorer emotional adjustment, higher ‘perceived stress’, and poorer ‘family functioning’) (Bell, Summerson, & Konen, 1995; De Leon, 1995; Grams et al., 1996; Wallhagen & Lacson, 1999). Generally, there is a scarcity of research examining ethnicity and HLOC in relation to diabetes adherence.

There are numerous factors that influence HLOC, such as the type of health behaviour. Diabetes treatment involves a multifaceted regimen, therefore, the relationship between HLOC and diabetes adherence may be clearer if investigated in the context of specific treatment behaviours, in relation to the HBM, and considering ethnicity (Barroso et al., 2000).

For example, Glasgow, Toobert, Riddle, Donnelly, and Calder (1989) investigated the HBM and self-efficacy in relation to diabetes treatment adherence. They found that diabetes patients had higher ‘self-efficacy beliefs’ in relation to taking medication. In contrast, diabetes patients had lower ‘self-efficacy beliefs’ in relation to dietary treatment tasks. Furthermore, participants perceived more ‘barriers to carrying out treatment’ for dietary treatment relative to medication treatment. With reference to these findings, it may be proposed that ‘internal HLOC’ is linked to ‘perceived barriers to treatment’ and diabetes treatment adherence.

## **2.45 Beliefs about Treatment: Food Beliefs**

Research relating to beliefs about food and eating will be discussed in the following sections. Section 2.451 outlines major theoretical perspectives on ‘food beliefs’, and section 2.452 deals with the relationship between ‘food beliefs’ and dietary behaviour. The three subsequent sections cover ‘beliefs about food’ in relation to culture (2.453), the ‘Health Belief Model’ (HBM) (section 2.454), and ‘Locus of Control’ (LOC) (2.455).

### **2.451 Theoretical Basis of the Food Belief Construct**

This section will provide a definition of ‘food beliefs’ and a standpoint from which to understand the role of ‘food beliefs’ in determining dietary behaviour. The importance of maintaining healthy eating patterns to disease prevention is supported in

research and is a central focus of healthcare within Australia and other Western societies (Brownell & Cohen, 1995a, 1995b; Lands, 2001; Pekka, Pirjo, & Ulla, 2002).

Definitions of eating are important in order to operationalise what food means to people and understanding how to promote dietary behaviour change (Grunert, 1989; Jackson, 1996). These definitions vary according to discipline. For example, a sociological perspective presupposes that social and group interactions shape individual eating behaviour (Gronow, 1997). An anthropological perspective primarily assumes that eating behaviour and culture are inseparable: eating is both a process of cultural expression and a cultural artefact (Pelto, Pelto, & Messer, 1989). In psychology eating behaviour is primarily examined in terms of individual experiences, affect, and cognitions (Grunert, 1989; Kittler & Sucher, 1998).

Psychological research concerning beliefs and attitudes about food and eating has predominantly focused upon eating disorders (Bonifazi, Crowther, & Mizes, 2000; Cooper, Todd, & Wells, 1998; Drewnowski, Pierce, & Halmi, 1988; Leung, Waller, & Thomas, 1999; Liebman, Cameron, Carson, Brown, & Meyer, 2001; Martin & Bellisle, 1989; Schur, Sanders, & Steiner, 2000). There is a lack of cross-cultural studies in psychology regarding 'beliefs about food'. A rare study investigating ethnic group differences in 'food beliefs' related to food and taste found British and Dutch people scored higher on 'food taste' subscales than Finnish people; while, Finnish participants had stronger 'positive attitudes toward low-fat products' (Roininen et al., 2001).

In this thesis 'food beliefs' are defined as beliefs about any physiological, psychological, social, or cultural purposes of food and eating (Jackson, 1996). For example, people may believe eating is primarily a means of promoting health or they may believe them to be primarily a means of obtaining good taste or enjoyment (Gronow, 1997; Jackson, 1996).

#### **2.452 Dietary Behaviour, Dietary Adherence, and Food Beliefs**

There is research that demonstrates 'food beliefs' are linked to dietary behaviour, however little research has investigated 'beliefs about food' in relation to treatment adherence among clinical populations (Barr & Chapman, 2002; Berg, Jonsson, & Conner, 2000; Brewer, Blake, Rankin, & Douglass, 1999; Brug, Lechner, & De Vries, 1995; Cachelin, Striegel-Moore, & Brownell, 1998; Gibson, Wardle, & Watts, 1998; Grogan, Bell, & Conner, 1997; Le Bigot Macaux, 2001; Lindeman &

Stark, 1999, 2000; Palmer & Leontos, 1995; Roos, Prattala, & Koski, 2001). Empirical findings in the health sciences and public health implicitly classify ‘beliefs about food’ into four main spheres: ‘social food beliefs’ (see section 2.4521), ‘health-related food beliefs’ (section 2.4522), ‘food beliefs relating to taste’ (section 2.4523), and ‘cultural food beliefs’. Literature pertaining to ‘cultural food beliefs’ will be covered in section 2.453.

#### **2.4521 Social Food Beliefs**

The influence of family, friends, and society on eating behaviour is a major thrust of research regarding ‘food beliefs’ (Abramovitz & Birch, 2000; Badruddin, Jafri, Ahmed, & Abid, 1999; Barr & Chapman, 2002; Baughcum, Burklow, Deeks, Powers, & Whitaker, 1998; Brug et al., 1995; Cachelin et al., 1998; Cullen et al., 2001; Lee, Mitchell, Smiciklas-Wright, & Birch, 2002; McConaghy, 1989; Schur et al., 2000; Stafleu, Van Staveren, De Graaf, Burema, & Hautvast, 1995; Stratton & Bromley, 1999). For example, many studies instigate the internalization of societal thinness ideals in the development of eating disorders (Bilukha & Utermohlen, 2002; Lindeman & Stark, 2000). Food and eating may be seen as a means of socialising, interacting, and communicating with others (Furst, Connors, Bisogni, Sobal, & Falk, 1996). For example, research supports the notion that people express their identity within society via their food choices and eating habits (Bissonnette & Contento, 2001; Lindeman & Stark, 1999).

#### **2.4522 Health-related Food Beliefs**

This thesis examined ‘food beliefs’ regarding health and taste. There is a substantial amount of research showing that beliefs about the healthiness or nutritional value of foods relate to healthy dietary behaviour. People who believe that a particular food is healthy, regardless of whether it is actually healthy or not, have been shown to consume more of that food (Dusdieker, Booth, Seals, & Ekwo, 1985; Ford, Dawson, & Mogridge, 1989; Grotkowski & Sims, 1978; Jones, 1987; Kaufmann, Poznanski, & Guggenheim, 1975; Kronl, Lau, Yurkiw, & Coleman, 1982; McConaghy, 1989; Morse, Sims, & Guthrie, 1979; Pomerleau et al., 2001; Tuorila & Pangborn, 1988).



### 2.4523 **Food Beliefs relating to Taste**

Empirical findings shows that believing a food tastes good relates to greater consumption of that food (Barr & Chapman, 2002; Berg et al., 2000; Brewer et al., 1999; Brug et al., 1995; Cachelin et al., 1998; Contento et al., 1993; Gibson et al., 1998; Grogan et al., 1997; Krongl et al., 1982; Le Bigot Macaux, 2001; Lindeman & Stark, 1999, 2000; Palmer & Leontos, 1995; Richardson, Shepherd, & Elliman, 1993; Roos et al., 2001; Rosin, Tuorila, & Uutela, 1992; Taylor & Caldwell, 1985; Tuorila & Pangborn, 1988; Tuorila, Pangborn, & Schutz, 1990). Most of the studies investigating ‘food beliefs about health and taste’ seem focused on particular foodstuffs. It may be useful to investigate ‘beliefs about food’, in general, to determine whether people are more inclined to eat food they believe to be healthy or whether the taste of food is more likely to take precedence over health matters.

### 2.453 **Ethnicity and Food Beliefs**

This section reviews studies in the health sciences and public health showing that cultural beliefs and practices impact upon dietary behaviour. Food is a principal dimension of culture, and food-related beliefs and practices are the center of spiritual or religious events, medicinal traditions, festivities, and other rituals in most ethnic groups (Kittler & Sucher, 1998). Many anthropological texts illustrate ‘beliefs about food’ intrinsic to particular cultures (Bamber, 1998; Chang, 1977; Cohen, 1997; Manderson, 1986), however there seems a scarcity of studies that compare ‘food beliefs’ between different cultures as was done in this thesis.

Cultural beliefs relating to food as medicine and relating to eating as a form of spiritual or religious expression have been shown to impact upon dietary behaviour (Chan, 1995; Farrales & Chapman, 1999; Fernandez & Guthrie, 1984; Gittelsohn, Thapa, & Landman, 1997; Greenhalgh, Helman, & Chowdhury, 1998; Ho, 1985; Liou & Contento, 2001; Lopez-Carrillo, Fernandez-Ortega, Costa-Dias, Franco-Marina, & Alejandro-Badillo, 1995; Melnyk & Weinstein, 1994; Neumark-Sztainer, Story, Perry, & Casey, 1999; Real, Kumar, Nanda, & Vanaja, 1982; Saowakontha et al., 1995; Seydi & Ba, 1993; Shifflett, 1976; Sho, 2001; Story & Harris, 1988). For example, cultural beliefs about food aligned with medical guidelines have been linked to healthy eating, and dietary information communicated in cultural context has been found associated

with healthier dietary behaviour (Bentley et al., 1991; Ikeda, Pham, Nguyen, & Mitchell, 2002; Palmeri, Auld, Taylor, Kendall, & Anderson, 1998).

#### **2.454 The Health Belief Model and Food Beliefs**

A considerable amount of research has been conducted to examine ‘perceived barriers to healthy eating’ and beliefs relating to food. Studies of this type have primarily focused on dietary behaviour such as consumption of fruit, vegetables, fat, and starchy food consumption, and eating during pregnancy. There is a lack of empirical studies, however, investigating the entire HBM in relation to ‘beliefs about food’, particularly with diabetes patients. This section reviews studies concerning the links between HBM, food beliefs, LOC, and culture.

Beliefs about the health benefits of food have been associated with healthy eating, whereas beliefs about the cost, convenience, availability, and taste of food have been associated with barriers to eating healthy (Anderson et al., 1998; Brown et al., 2002; Guldán, Zhang, Zeng, Hong, & Yang, 1995; Lea & Worsley, 2002; Lloyd, Paisley, & Mela, 1995; Phillips & Briggs, 1975; Smith & Owen, 1992). For example, Lloyd, Paisley, and Mela (1995) found one of the most consistent ‘perceived barriers to reducing fat consumption’ was ‘perceived taste quality’. Harnack, Stubbs, Block, Subar, Lane, and Brand (1997) found that of the ‘perceived barriers to eating a healthful diet’ ‘perceived ease of eating a healthful diet’ was most strongly and consistently predictive of fat, fibre, fruit, and vegetable intake. Stubenitsky and Mela (2000) found that ‘barriers to increasing starchy food intake’ included the perception that starchy food intakes should be reduced to achieve a healthier diet.

Little research has investigated ‘perceived barriers’ in relation to LOC and ‘food beliefs’. There are some study findings, however, suggesting ‘internal LOC’, ‘perceived barriers to eating healthy’, and ‘believing in the healthiness of food’ are associated with healthy eating (Campbell et al., 1998; Hollis et al., 1984; Resnicow et al., 2000).

Moreover, there seems to be a paucity of research investigating cultural issues in respect to ‘perceived barriers to eating healthy’ and ‘beliefs about food’. Neumark-Sztainer, Story, Perry, and Casey (1999) showed that factors perceived as influencing food choices included parental influence on eating (e.g., culture or religion), benefits of foods (e.g., health), and preferences for unhealthy foods (e.g., taste).

### **2.455 Locus of Control and Food Beliefs**

There is a lack of research aimed to determine linkages between LOC and 'food beliefs'. Studies into 'internal health locus of control' and 'self-efficacy' relate to the 'belief that eating can promote health' and to healthy dietary behaviour (Brug et al., 1995; Campbell et al., 1998; Hollis et al., 1984; Resnicow et al., 2000). 'Food beliefs', other than those relating to health, seem to have not yet been investigated in relation to LOC.

### **2.456 Diabetes and Food Beliefs**

Most diabetes patients struggle to adopt and maintain healthy eating habits (Fexete, 2000; Nothwehr & Stump, 2000), therefore issues surrounding food and eating are detrimental to diabetes management. Diabetes research, however, has seldom focused upon the area of food beliefs. Most diabetes research investigating beliefs or attitudes regarding food has been conducted with patients who also have an eating disorder. Other studies discussed in this section investigated hunger and taste perception, typology of dietary behaviour, beliefs about the role of diet in diabetes causality, patient concerns about and perceived barriers to carrying out dietary treatment, autonomy in managing dietary treatment, and cultural beliefs about food. This discussion will exemplify the potential relationship between 'food beliefs' with diabetes regimen adherence, and possible linkages of 'food beliefs' with the HBM, LOC, and ethnicity.

There are a handful of studies regarding nutrient preferences (fats, protein, or carbohydrates), perception of hunger signals, and perceptions of sweetness among people with diabetes. Although these studies are not directly related to the current research objectives, they support the contention that food and eating are psychophysiological phenomenon. For example, the findings suggest that diabetes patients perceive pleasantness of food in relation to its sweetness (Tepper, Hartfiel, & Schneider, 1996), patients with more severe clinical profiles prefer protein rich foods (Rowland, Joyce, & Bellush, 1985), and sensitivity to glucose is lower among people who have first-degree relatives with diabetes (Settle, 1981).

Findings in respect to eating disorders among diabetes patients demonstrate a two-way relationship between pathological cognitions regarding food/eating and poor

treatment adherence, probably due to the centrality of diet in diabetes self-management (Lloyd, Steel, & Young, 1987; Mannucci et al., 2002; Nielsen, Borner, & Kabel, 1987; Olmstead, Daneman, Rydall, Lawson, & Rodin, 2002; Powers et al., 1983; Rosmark et al., 1986; Surgenor, Horn, & Hudson, 2002). For example, diabetes management incorporates dietary restrictions that may contribute to excessive hunger and disinhibition (e.g., bulimia and bingeing disorder) or to excessive restraint (e.g., anorexia) (Crow, Kendall, Praus, & Thuras, 2001; Herpertz et al., 1995; Herpertz et al., 1998). Likewise, diabetes treatment weight control, and weight gain is a side effect of diabetes medication. This may evoke negative body image and a greater drive for thinness (Carroll, Tiggemann, & Wade, 1999; Colton, Rodin, Olmsted, & Daneman, 1999; Khan & Montgomery, 1996; Krch, Csemy, & Hrachovinova, 2000). For example, a study carried out by Steel, Lloyd, Young, and MacIntyre (1990) found that within the first year of diagnosis Type I Diabetes patients experienced changes in body image, possibly predisposing them to the development of eating disorders (Khan & Montgomery, 1996). Most people who develop diabetes, particularly in adulthood, bring with them eating experiences and 'food beliefs' that interact with dietary treatment instruction and may underlie dietary adherence. There is a need, therefore, to conduct research to further understand the association between 'food beliefs' and treatment adherence among diabetes patients, even in the absence of eating disorders.

The author identified a small number of studies in the area of typologies and behavioural responses to diabetes dietary treatment (Maclean, 1991; Schlundt et al., 1999). The proposed classifications of dietary behaviour among diabetes patients included 'adherence to the meal plan', 'under-eating', 'over-eating', 'impulsive eating', and 'lifestyle or contextual influenced eating behaviour'. Typologies of dietary treatment behaviour may be linked to different cognitions regarding food. For example, Maclean's (1991) findings suggested that diabetes patients sought a balance between physical health and psychosocial wellbeing through food choice and other eating-related decisions. According to the theory espoused by Maclean (1991), poorer adherence occurred when adherence to treatment compromised psychosocial wellbeing. In the face of such a dilemma, diabetes patients were more likely to take liberties with diet to meet psychosocial needs (Maclean, 1991).

There is empirical evidence to support a link between patient beliefs about diet and diabetes causality with regimen adherence (Schoenberg, Amey, & Coward, 1998). For example, Hunt, Valenzuela, and Pugh (1998) found Type II patients who believed that diabetes is the result of dietary factors and one's own behaviour (reflecting 'internal LOC') were more likely to adhere to treatment; compared to patients who believed diabetes was due to hereditary factors or events (reflecting 'external LOC'). These findings suggest that the relationship between food beliefs, LOC, and diabetes treatment adherence may be a fruitful area for further study. Research concerning LOC in relation to food beliefs among diabetes patients seems absent, apart from a study conducted by Weiss (1999). The study examined ego development, autonomy in dietary management, and quality of diet in Type I Diabetes patients (Weiss, 1999).

Although diabetes studies focusing upon the HBM and beliefs about food are lacking, there are some noteworthy findings regarding 'perceived barriers to dietary adherence'. For example, Mantani et al. (2000) found non-adherence was associated with the 'belief that adhering to diabetes dietary guidelines was difficult'. Additionally, Tierney (1996) found perceived dietary restrictions and restraint related to 'perceived barriers to healthy eating habits' among non-diabetic people. 'Perceived dietary restrictions and restraint', however, was not related to 'perceived barriers to dietary adherence' among people with diabetes (Tierney, 1996).

Cultural beliefs about food and eating among diabetes patients need further research. There is particularly a lack of studies investigating cultural food beliefs in relation to treatment adherence. Empirical evidence suggests that some cultural beliefs regarding food may lead to non-adherence (Lang, 1989). For instance, the findings of Greenhalgh, Helman, and Chowdhury (1998) demonstrated that food believed to be health-giving or "strong" (e.g., white sugar, lamb, beef, ghee derived from butter, solid fat and spices) among diabetes patients of Bangladeshi background were opposite to the recommended diet for people with diabetes (Greenhalgh, Helman, & Mu'min Chowdhury, 1998).

#### **2.46 Beliefs about Healthcare: Attitudes toward Medical Doctors**

The following sections outline empirical literature exploring facets of the doctor-patient relationship and how they relate to health behaviour (section 2.462 and 2.463), ethnicity (section 2.464), 'beliefs about food' (2.465), the 'Health Belief Model' (HBM)

(section 2.466), 'Locus of control' (LOC) (section 2.467), and diabetes (section 2.667). Although, there has been a considerable amount of research regarding the doctor-patient relationship in the context of mental illness (e.g., Mitchell & Aron, 1990), this discussion is confined to studies related to consultative relationships with medical practitioners for physical ailments.

#### **2.461 Definition of the Construct**

In this thesis the terms doctor, medical practitioner, general practitioner, health professional, and physician refer to Western medical consultants. This section reviews perceptions, attitudes, and beliefs about doctors, however the instrument employed in this study is only indicative of 'attitudes towards doctors'. In social psychology the distinction between a belief, acceptance of a proposition, and an attitude, an evaluation, is the subject of theoretical and methodological debate (McKnight & Sutton, 1994). This issue, however, will not be discussed here as it is beyond the scope of the present thesis.

#### **2.462 Treatment Adherence and the Doctor-Patient Relationship**

Over the past three decades there has been a shift from the earlier paternalistic model toward collaborative relationships between doctors and patients. Consequently, there is an increasing amount of research investigating the patient's perspective on medical consultations (Butler, Rollnick, Pill, Maggs-Rapport, & Stott, 1998; Carmen Luciano & Herruzo, 1992; Castro, 1974; Coleman & Murray, 2002; Gillespie, 2001; Golin, DiMatteo, & Gelberg, 1996; Leopold, Cooper, & Clancy, 1996; Make, 1994; McCann & Blossom, 1990; Squier, 1990; Warner, 1981). This section summarises research illustrating that treatment adherence relates to patient perceptions of doctors and aspects of the doctor-patient relationship.

Literature pertaining to the training and education of medical practitioners emphasises the interaction between doctor and patient, particularly effective communication (Brown, 2001; Brunett et al., 2001; Cohen & Bishop, 1995; Dube, O'Donnell, & Novack, 2000; Griffin, 1998; Murphy, Chang, Montgomery, Rogers, & Gelb Safran, 2001; Ong, de Haes, Hoos, & Lammes, 1995; Roberts, 2000; Rubenstein, O'Connor, Nieman, & Gracely, 1992; Sommaruga, Bettinardi, & Opasich, 2001; Stewart et al., 1999; Todd, 1989; Tudiver et al., 2001; Vermeire, Hearnshaw, Van

Royen, & Denekens, 2001; Vieder, Krafchick, Kovach, & Galluzzi, 2002; Wright, 2000). The doctor and patient relationship is important because empirical findings show that features of this relationship relate to poor adherence to treatment (Alvarez-Gordillo, Alvarez-Gordillo, Dorantes-Jimenez, & Halperin-Frisch, 2000; Noble, 1998; Rost, Carter, & Inui, 1989). Such features include misunderstandings in prescribing decisions (Britten, Stevenson, Barry, Barber, & Bradley, 2000) and a mismatch between the patient's expectations of care with the physician's consultation style (Roberts, 2002).

Patient perceptions of the consultative relationship, such as patient satisfaction with the healthcare provided and attitude towards doctors, have been shown to impact upon regimen adherence (Apter, Reisine, Affleck, Barrows, & ZuWallack, 1998; Barry, Bradley, Britten, Stevenson, & Barber, 2000; Bartlett et al., 1984; Bultman & Svarstad, 2000; Conroy, Siriwardena, Smyth, & Fernandes, 2000; Eisenthal, Emery, Lazare, & Udin, 1979; Evans, Ferrando, Rabkin, & Fishman, 2000; Griffiths et al., 2001; Hand & Bradley, 1996; Hauck, Zyzanski, Alemagno, & Medalie, 1990; Martin, DiMatteo, & Lepper, 2001; Mostashari, Riley, Selwyn, & Altice, 1998; Rigby & Metzger, 1992; Safran et al., 1998; Segall & Goldstein, 1989; Sherbourne, Hays, Ordway, DiMatteo, & Kravitz, 1992; Thom, Ribisl, Stewart, & Luke, 1999). For example, studies suggest women's 'attitude toward doctors' is one of the most significant in deciding whether or not to undergo prenatal tests (Browner, Preloran, & Cox, 1999; Marteau et al., 1992).

#### **2.463 Dietary Behaviour, Medication Adherence, and the Doctor-Patient Relationship**

A fruitful area for further research, seemingly not pursued as yet, is to contrast the linkages between medication adherence and the doctor-patient relationship, with the linkages between dietary behaviour and the doctor-patient relationship. Past studies demonstrate that health beliefs relate differently to medication adherence as apposed to how they relate to dietary behaviour (discussed in sections 2.432 and 2.443).

#### **2.464 Ethnicity and the Doctor-Patient Relationship**

This section reviews research in the health sciences, which supports the notion that a patient's cultural beliefs and practices impinge upon that person's relationships with medical practitioners. As in the society at large, cross-cultural communication skills have become a key component of training for medical practitioners (Blochliker,

Tanner, Hatz, & Junghanss, 1997; Carrese & Rhodes, 2000; Chapman, Walker, Cluley, & Fabbri, 2000; Cohen & Bishop, 1995; Green, Betancourt, & Carrillo, 2002; Hamilton, 1996; Irvine, McPhee, & Kerridge, 2002; Kennedy, Tait, & Mason, 2001; Rubenstein et al., 1992; Shapiro & Lenahan, 1996; Skelton, Kai, & Loudon, 2001; Todd, 1989; Yamada, Greene, Bauman, & Maskarinec, 2000). It is important for a medical doctor to understand the cultural context of the relationship they have with a patient to optimise professional support and ultimately improve patient adherence to treatment.

There are studies illustrating that a patient's cultural background shapes communication with their doctor (Blochliker et al., 1997; Gardner & Chapple, 1999). For example, to effectively discuss negative subject matter with a patient a doctor may need to understand the patient's cultural beliefs and customs (Carrese & Rhodes, 2000; Younge, Moreau, Ezzat, & Gray, 1997). Very few studies exploring cross-cultural communication also examine the impact of the doctor-patient interaction upon patient regimen adherence.

It has been suggested that the patient's cultural beliefs relate to the doctor-patient relationship, as perceived by the patient (Van Ryn & Burke, 2000). For instance, in a study by Conroy, Siriwardena, Smyth, McGee, and Fernandes, (2000) factor analysis failed to confirm a clear-cut distinction between 'positive and negative attitudes to doctors' across different ethnic groups. Factors which loaded in opposite directions in the original United Kingdom study loaded in the same direction in the Irish sample.

Cultural differences in how patients perceive doctors may relate to treatment adherence. For example, Meredith and Sui's (1995) findings suggest, relative to White persons, Asian and Pacific Islander people were 'less satisfied' with and 'perceived less sharing' in the doctor-patient relationship'. Moreover, Andresen's (2001) study interviewed Japanese, Korean, and Indian immigrants to the United States. It was shown that these groups hold vastly different expectations concerning: when to seek medical assistance; the role of doctor in the community; the role of the patient and the patient's family in conversations with the medical specialist; the roles of doctors versus nurses; and issues of privacy and disclosure to patient and family. Another investigation by Griffiths et al. (2001) suggested a link between ethnicity and perceptions of doctors with regimen adherence. They found people of South Asian background described less



confidence in controlling their asthma, were unfamiliar with the concept of preventive medication, and often expressed less confidence in their general practitioner. South Asian patients described difficulty accessing primary care during asthma exacerbations and were registered at practices with weak strategies for asthma care.

#### **2.465 Food Beliefs and the Doctor-Patient Relationship**

There is a need to examine how the doctor-patient relationship relates to 'beliefs about food', particularly considering the rise in dietary treatments for chronic illness. One rare study by McIntosh (1995) showed that those participants who believed in the efficacy of health foods were more likely to give physicians and mass media as sources of influence or information for reducing their red meat consumption. Other studies examining dietary behaviour do not seem to focus upon linkages between 'food beliefs and the doctor-patient relationship (Anderson et al., 2001; Gupta & Horne, 2001; Marquart & Sobal, 1994).

#### **2.466 The Health Belief Model and the Doctor-Patient Relationship**

The doctor-patient relationship is a fundamental parameter in patient education. The HBM can be used to direct doctor-patient education, with the aim of addressing barriers to treatment adherence and to convey accurate information regarding health risks and treatment benefits (Elder, Ayala, & Harris, 1999). It may be useful, therefore, to explore the links between the HBM, patient cognitions regarding doctors, and treatment adherence.

Empirical findings suggest that the degree of adherence to treatment relates to the congruence of an individual's health beliefs with that of their health provider. Greenfield, Borkan, and Yodfat (1987) found among Moroccan Jewish people with hypertension that congruence of health beliefs based on the HBM between patients and doctors related positively to treatment adherence. The beliefs embedded in the HBM have also been found to explain the decision to consult with a health professional (Goodloe, 1997; Hansen, Bobula, Meyer, Kushner, & Pridham, 1987).

An extended version of the HBM includes the variable 'cues to (healthy) action,' which consists of cues from doctors and it relates to treatment adherence (Stein, Fox, Murata, & Morisky, 1992). 'Cues to action' from doctors may be linked to patient 'perceptions of treatment benefits', 'barriers to carrying out treatment', and 'perceived

susceptibility to the health threat'. For example, according to a study by Black et al. (2001), predictors of adherence to breast cancer screening included physician recommendation and 'perceived treatment benefits'. In addition, Austin, Ahmad, McNally, and Stewart (2002) found positive cues to undergoing screening included physician recommendation among Hispanic women, although they perceived many 'barriers to screening for cancer' and felt 'less susceptible to cancer'.

Other aspects of the doctor-patient relationship have been found associated with the HBM (Lin et al., 1995). In a study conducted by Fincham and Wertheimer (1985) patients who adhered poorly with drug treatment reported less feedback from physicians, less 'benefits of treatment', and more 'barriers to treatment'. Furthermore, Rimer, Trock, Lerman, and King (1991) found among women who had mammograms in the past year the most important variable was physician support. Additional significant variables included being 'willing to pay for a mammogram' ('perceived costs or barriers') and 'recognising that older women were at greater risk for breast cancer' ('perceived health threat'). Rees (1985) found that patient adherence to treatment for alcoholism was associated with expectations of improvement by remaining on treatment ('perceived treatment benefits'), 'perceived severity of their drinking problem', and 'satisfaction with aspects of the doctor-patient relationship'.

#### **2.467 Locus of Control and the Doctor-Patient Relationship**

Due to the increasing incidence of chronic illness and the necessity for self-care, there has been a shift from physician-dominated medical consultation toward an emphasis upon patient empowerment (Allen, 1998). Consequently, perception of control within the doctor-patient relationship has become a focus of research (Shapiro, Prislun, Shapiro, & Lie, 2000). This section will exemplify possible linkages between patient perceptions of medical doctors, aspects of the doctor-patient relationship, HLOC, and adherence to medical treatment.

There are empirical data supporting a relationship between patient satisfaction with the healthcare provided by their physician, 'internal HLOC', and adherence to medical recommendations (Lochman, Dain, & Babick, 1984; Phillips, Kerlikowske, Baker, Chang, & Brown, 1998; Williams, Rodin, Ryan, Grolnick, & Deci, 1998). For instance, Fajardo, Saint-Germain, Meakem, Rose, and Hillman (1992) found women who had undergone mammography were more likely to see a physician regularly, to

practice breast self-examination, to be more knowledgeable about mammography and breast cancer, to be less concerned over the cost of mammography, to be generally satisfied with their healthcare, and to believe they have a greater sense of control over their health.

Another finding in this area is that ‘powerful-others HLOC’ relates to an effective doctor-patient relationship and with adherence to treatment (Dupen, Higginbotham, Francis, & Cruickshank, 1996; Lau & Ware, 1981; Thomas & Fick, 1995). Moreover, ‘chance HLOC’ seems to be related to a more ‘negative relationship with one’s doctor’ and non-adherence to treatment (Dupen et al., 1996; Lau & Ware, 1981).

#### **2.468 Diabetes and the Doctor-Patient Relationship**

This section is a review of research related to the interpersonal relationships between medical doctors and diabetes patients. Studies of which investigate patient satisfaction with healthcare, the degree to which patients and doctors hold similar views about diabetes, and patient beliefs about healthcare in the context of culture. The following review will exemplify the potential relationship of ‘patient attitudes toward medical doctors’ to diabetes treatment adherence, and the connections between ‘perceptions of doctors’ with the HBM and HLOC. There appears to be a gap in diabetes research regarding ‘food beliefs’ and ‘attitudes toward doctors’.

Findings suggest that the nature of the doctor-patient relationship is associated with the level of patient adherence to diabetes regimens (Viinamaeki, Niskanen, Korhonen, & Taehkae, 1993). For example, Landel (1996) found that a ‘positive relationship with one’s health professional’ related to adherence to diet and medical appointments. Also, a study conducted by Kutz (2000) showed a link between ‘patient satisfaction with the doctor-patient relationship’ and diabetes treatment adherence.

What constitutes a positive doctor-patient relationship could be one or a combination of many factors. One factor, frequently investigated in diabetes research, is the congruence between doctor and patient beliefs about diabetes and its treatment. Two areas have been researched in particular: The congruence between doctor and patient views about: who is in control or responsible for diabetes treatment and the goals and concerns related to diabetes treatment. These two areas will now be discussed.

Patient empowerment is detrimental to optimal diabetes self care, however equally important is regular medical consultation. It is foreseeable, therefore, that there are dissimilarities between patient and doctor beliefs about who directs diabetes treatment. For instance, Thorne and Paterson (2001) found doctors who were supportive of patient autonomy in diabetes care were regarded more positively by their patients. There is a scarcity of research, however, investigating LOC in relation to 'attitudes toward medical doctors' among diabetes patients.

Research that explicitly examines 'patient attitudes toward medical doctors' in conjunction with the HBM seems absent. There is research, however, showing treatment non-adherence may be associated with incongruence between doctor and patient in their perceptions of treatment difficulties (potentially relevant to 'perceived barriers to treatment'), treatment goals ('perceived treatment benefits'), and their perceptions of the 'severity of diabetes' (Anderson, Fitzgerald, Gorenflo, & Oh, 1993; Woodcock & Kinmonth, 2001). For instance, findings suggest that diabetes patients experience frustration in the face of doctor-patient disagreement about the nature and treatment of diabetes (Freeman & Loewe, 2000). Boyer, Lerman, Shipley, McBrearty, Quint, and Goren (1996) found doctor-patient discordance in their 'beliefs about diabetes treatment benefits and costs' related to patient adherence.

Perceptions of the 'severity of diabetes' may interact with 'attitudes toward doctors' to determine patient adherence to treatment. For example, Weiss and Hutchinson (2000) found that 'internal warnings regarding the health-threat of diabetes complications', generated within the self, were more strongly associated with treatment adherence compared to 'external warnings from health professionals'.

Empirical evidence illustrates that cultural beliefs about healthcare and medical doctors are associated with diabetes treatment adherence (Hunt, Arar, & Akana, 2000; Judkins, 1978; Ponchillia, 1993). For example, Hunt, Pugh et al. (1998) found that 'beliefs about the power of medicine' under-lie treatment decisions among Mexican American people with diabetes. Walsh (1999) also found economic marginality, domestic workload, the saliency of religion, family relations, a proactive response to illness, and the negative impact of illness differentiated Hispanic American persons with diabetes from Anglo-Saxon American persons; and that these cultural beliefs impacted upon the doctor-patient relationship and utilisation of health services.

## 2.5 *Cultural Issues and Diabetes Treatment*

This study will investigate differences in health beliefs and treatment adherence between Maltese and Anglo-Saxon diabetes patients to assist in the understanding the cultural context of diabetes treatment. This section, therefore, is primarily a discussion of cultural, health, and diabetes-related issues with reference to Maltese and Anglo-Saxon people. It is well established that people who belong to the same cultural group share similar health or illness perceptions and practices (Garro, 1990; Good, 1977; Grams et al., 1996; Nichter & Nordstrom, 1989; Sunday et al., 2001). Particularly relevant to this study, is the increasing empirical evidence showing people of different cultural groups respond differently to mainstream medical treatment (Blackhall et al., 1999; Bottorff et al., 1998; Diabetes-Australia, 1997; Haug, Akiyama, Yryban, Sonoda, & Wykle, 1991; Meyerowitz et al., 1998; Musey et al., 1995; Remennick, 1999; Sharts-Hopko, 1996). People may not accept effective medical treatment because their cultural beliefs and health practices differ from mainstream diabetes care, and also because they do not have access to health information that is more aligned with their cultural beliefs and experience (Bertera, 2003; De Vera, 2003; Diabetes-Australia, 1997; Kieffer, Willis, Arellano, & Guzman, 2002; Miller, 1997; Sharts-Hopko, 1996). Hence, culturally-appropriate services are becoming an integral part of diabetes services (Colagiuri, Colagiuri, & Ward, 1998; Western Region Health Centre, 2001).

### 2.51 **Maltese People and Culture**

This section provides a socio-cultural framework from which to understand the Maltese community in Australia and it also demonstrates that diabetes is a particularly serious problem for Maltese people. Section 2.511 outlines the history of Malta, the Maltese migration experience, and it includes some demographic data describing Maltese people in Australia. Section 2.512 presents statistics related to life expectancy, mortality, and illness among Maltese people in Australia. Section 2.513 is a review of empirical studies concerning diabetes among Maltese people. Maltese beliefs and practices (section 2.514), particularly in relation to health (section 2.515) and food (section 2.526), are the topics covered in the final sections.

### **2.511 The Migration of Maltese People to Australia and Demographic Data**

The soft yellow limestone gives a continuity to the scenery. Houses, villages and whole towns seem to grow up out of the rocky matrix from which they are built...This stone, so characteristic of Malta, provides a gradual transition from the open country to the compact, densely populated communities in which the people live (Boissevain, 1965, pp. 1-2).

Malta consists of a group of five Islands, three of which are inhabited: Malta, Gozo, and Comino. There are two main Islands, Malta, the largest and the most populated, and Gozo. These tiny Islands compose a country that is much more densely populated than India and China (Malta- 1,164 people per sq. km; India- 288.4 people per sq. km; China- 124.5 people per sq. km). Malta is nearest to Sicily, and approximately the same distance (200 miles) from Tunisia as it is from Tripoli (see figure 3). The Maltese people have been in contact with their European and North African neighbours for centuries. Both cultures have made contributions that the Maltese people have adapted to their own uses. For instance, the Maltese language is Semitic with borrowings from Italian/Sicilian, French, Spanish, and English. It is the only Semitic language to use the Roman alphabet (Borg, 1994; Chetcuti, 1984). Despite this intimate connection with, largely, Moslem countries, Catholic beliefs have been wide spread among Maltese people since the shipwreck of Saint Paul (apostle of Christ) on Malta in 60 A.D.

Malta has megalithic temples that are among the world's oldest. Some have been dated to 3600 B.C. (Rountree, 1999, 2001). Malta, with its central geographical location, has a long history of colonisation and invasion by many of the world's powers, including Phoenician, Carthaginian, Roman, Arabic, Norman, Spanish, Knights of St. John (of noble European families), French, and the most recent, British rule. British colonisation in Malta lasted approximately 150 years until the country's year of Independence, 1964 (Blouet, 1981).

In Malta, as in many parts of the world, the Second World War had profound social and economic ramifications (Micallef, 1981). The post-war increase in birth rates exacerbated Malta's old problem of overpopulation, and redundancies made by British military forces caused high numbers of unemployment and economic downturn. Mainly

as a result of these problems there was a huge wave of Maltese emigration following the end of the Second World War. No doubt, there were other less well articulated and defined reasons for emigration, such as the need to seek a better life (Cauchi, 1990; York, 1990).

English was the official language of Malta during British occupation and up until 1934. Even after Independence, English and Maltese remained the official languages. Most Maltese, therefore, around the time of World War II could speak some English and were familiar with British people. This may be a reason they endeavoured to migrate to English-speaking countries, such as Canada, America, and Australia (Attard, 1994).

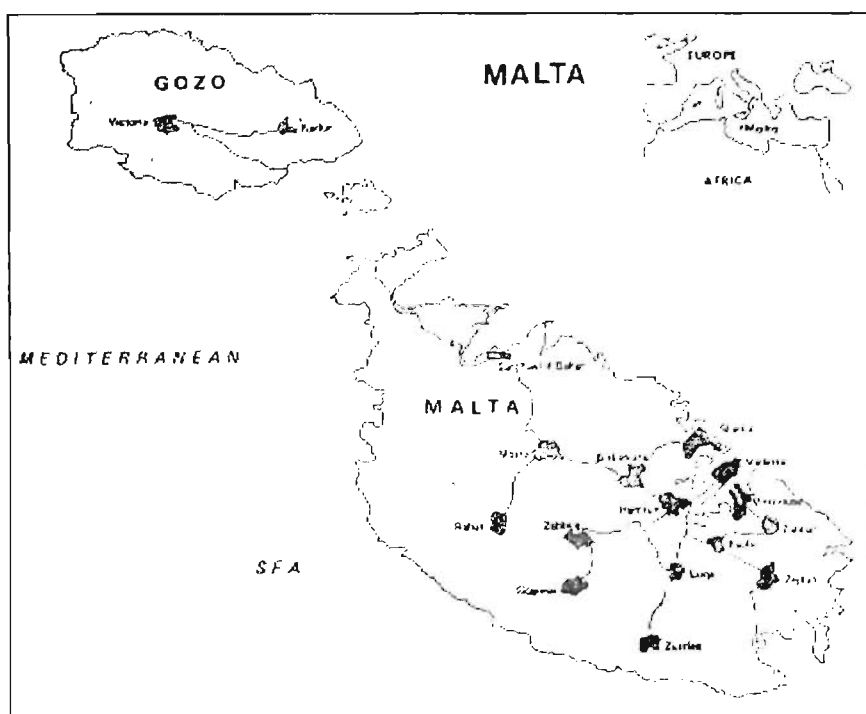


Figure 3

Geographical Location of Malta

From York (1986, p. 3)

The flow of Maltese migration was greatest in Australia, with up to 8000 people immigrating in a single year (McDonald, 2000; York, 1990). This was, probably because of the common British connection and the desire to populate Australia at that time. This was also due to the Malta-Australia assisted passage agreement struck in

1948 (York, 1990). The Maltese were the first non-Anglo-Saxon group to receive government-assisted passages, a scheme which was started to support British subjects and their former allies (Cauchi, 1990). This agreement was the result of a long campaign, by politicians from Malta, aimed at promoting Maltese immigration to Australia in order to address the post-war social and economic crises in Malta. The campaign emphasised, exaggerated, and falsely proposed that Maltese people were basically British and would eventually assimilate. Furthermore, the value of dry farming, manual labour, and trade skills among Maltese people were promoted as assets that could be used to better the Australian manufacturing, construction, and agricultural industries (York, 1990).

Maltese migration to Australia began in 1810, reaching a peak following World War Two, and plateaued in the 1970s (York, 1990). In 1961 the Malta-born population in Australia was seven times that of 1954 (19, 988). By 1971 that number had almost tripled (53,681). The most current 1996 census figures indicated that the population of Malta-born people (57,000) and their children (77,000) residing in Australia, excluding younger descendants, was 134,000 (McDonald, 2000). This compares with the population of Malta itself in 1996 of 375,000 (Cauchi, 1990). Now the Maltese Australian population, including the third generation, may almost match the population of Malta.

According to 1996 census data, the Malta-born population in Australia is ageing, concentrated in the ages of 40 to 64 years. The median age was 51.2 years and the largest age group between 45 to 59 years. Fifty-three percent were men and forty-seven percent were women. The majority of Malta-born people in Australia were residing in Sydney and Melbourne (80 percent), and the greatest concentration located in Sunshine, western metropolitan Melbourne. Sixty percent of Malta-born immigrants living in Victoria in 1996 arrived prior to 1981 (McDonald, 2000).

Among the Malta-born people in Australia in 1996, 40 percent left school before age 15 years and 4 percent never attended school. These figures contrast with the total Australian population in the same age group, in that 15.5 percent left school before age 15 years and 1 percent never attended school. In the absence of relevant data, the low education levels among Malta-born people in Australia, suggests that some Maltese people may have low levels of literacy. Only seven percent of Malta-born people in



Australia did not speak English well or at all, in contrast to 18.2 percent of Australian residents born in non-English-speaking countries (McDonald, 2000).

In 1996, the proportion of Malta-born people employed as labourers or in manufacturing and transport was double that of the total Australian population. Moreover, the proportion of people in the total Australian population employed in professional positions was more than double that of the Malta-born persons (McDonald, 2000).

### **2.512 The Health of the Maltese Community in Australia**

Even though empirical findings conducted in the 1980s suggest some serious health concerns for the Maltese community in Australia, more recent data seems absent. In the following discussion, therefore, figures concerning the health of Maltese Australians published in 1986 are compared with equivalent Australian population figures (Young, 1986).

Generally, among immigrants there is a gradual decrease in life expectancy with increasing years of residence in Australia. For Malta-born immigrants living in Australia the life expectancy for people who have resided in Australia for 20 years in 1986 was reduced by two to three years than that of Australia-born population. This reduction in life expectancy was one of the greatest of all overseas-born people in Australia. Similarly, the age-specific mortality ratio for Malta-born men in Australia was 30 percent higher than other Southern European-born men (Greek, Cypriot, Italian, Spanish, and Portuguese) in Australia. For Malta-born women it was 50 percent higher, most markedly for those aged 65 years and over (Young, 1986).

With reference to the data collected in 1986, Southern European-born people in Australia had lower rates of illnesses, such as respiratory disease and diseases of the circulatory system than that of Australia-born people. However, Malta-born immigrants had higher illness rates than other Southern European immigrants. By way of comparison, the causes of morbidity among Malta-Born immigrants were similar to that of British-born (English and Welsh) immigrants in Australia (Young, 1986). A number of studies in Malta have established the particularly serious issue of diabetes for Maltese people. Although studies in Australia are lacking, there is evidence to suggest that the

prevalence of diabetes is also high among Maltese people in Australia, similar to rates among Australian Aboriginal communities (see section 2.423).

There may be multiple reasons for the relatively high illness and mortality rates among Maltese people in Australia, such as genetic factors, dietary factors, smoking, and other lifestyle risk factors (Cauchi, 1990). Clearly, research is needed to understand why Maltese Australian people are developing chronic illnesses that are largely preventable (e.g., lung cancer) and dying from illnesses that are largely treatable (e.g., diabetes).

### **2.513 Diabetes Prevalence and Treatment Adherence among Maltese People**

In 1995 an estimated 2.5 percent of Australian people and 4.1 percent of people born over-seas had diabetes. The proportion of Europe-born Australians with diabetes was the highest, particularly for people of Southern Europe, such as Malta-born Australians (7.8 percent) (Australian Bureau of Statistics, 1995).

Research suggests that 10 to 20 percent of people in Malta have diabetes and that diabetes-related mortality is high (Bugeja & Azzopardi, 1999; Martin et al., 1984; Schranz, 1989; Schranz, 1995; Schranz & Prikatsky, 1989; Tuomilehto et al., 1988; Tuomilehto et al., 1994; Zammit Maempel, 1965; Zammit Maempel, 1978a). The relatively few studies conducted with Maltese people residing outside of Malta suggest similar prevalence rates in Australia. For example, Martin, Hopper, Dean, Campbell, and Hammond (1984) found among a Australian sample of Malta-born people residing in Sunshine (Victoria) 9.3 percent had Diabetes Mellitus or impaired glucose tolerance. In a study conducted by Dimech (1992) with a sample of Malta-born elderly persons, 26 percent reported having diabetes. The reason why diabetes is more prevalent among Maltese people is unknown. It may be due to dietary, genetic, or psychosocial factors. For example, similar to many indigenous groups, through their experience of colonization, the Maltese community imprudently changed from a rural society to a Westernised society, food was more readily available and industrialization meant less physical activity (Prasad & Srivastava, 2002).

A considerable amount of biomedical research has been conducted to investigate the pathogenesis of diabetes and its complications in Malta (Bugeja & Azzopardi, 1999; Jouglia et al., 1992; Martin et al., 1984; Papoz & EuroDiab Subarea C Study Group,

1993; Schranz, 1989, 1998; Schranz, 1995; Schranz & Prikatsky, 1989; Tuomilehto et al., 1988; Zahra, Mallia, Hardie, Bezzina, & Fenech, 2002; Zammit Maempel, 1965; Zammit Maempel, 1978a, 1978b). There is, however, a need to carry out further psychosocial research. Two rare diabetes studies investigated psychosocial issues relevant to Maltese people and found that there was a need for culturally-appropriate diabetes education in the Maltese Australian community (e.g., peer support) (Cassar & Schembri, 2002; Diabetes-Australia, 1997; Karantzas, 2003).

#### **2.514 Maltese People, Beliefs, and Practices**

This section contains a review of literature regarding Maltese cultural life. Four main areas are covered. First, literature in sociology and anthropology is discussed (section 2.5141), then empirical studies conducted with Maltese immigrants are presented (section 2.5142), findings of psychological research with Maltese people are outlined (section 2.5143), and finally this section summarises some aspects of Maltese culture particularly relevant to this thesis (section 2.5144).

##### **2.5141 Anthropological and Sociological Literature Regarding Maltese Culture**

Research pertaining to Maltese cultural beliefs and practices has been predominantly the domain of sociology and anthropology (Abela, 1995; Cassia, 1993). Moreover, such studies are either very specific to one area of Maltese culture or very general. For example, Boissevain's (1965) anthropological study focused upon religious festivals celebrating the village patron saint days. Due to the central role of these celebrations to family, community, village, church, and political life in Malta, Boissevain's (1965) study broadly described many aspects of Maltese culture in the 1960s; including the central role of the local priest to the spiritual and personal lives of the community, and the entanglement of family and village kinship. There seems to be a number of studies concerning the Maltese village festivals (Cremona, 1995), however there is a scarcity of cultural studies in the area of health (Aguis, 1990; Cassia, 1993). There are also few comparative studies of Maltese people with other ethnic groups (Cassia, 1993).

Abela's (1991) comparative research in sociology is particularly relevant to the current study. It was based on the European Value Systems Study carried out in the late 1980s. Abela (1991) contrasted beliefs between 10 West European countries, including

Malta. The study investigated a range of values related to family, religion, work, leisure, tourism, community issues, and social problems. Life satisfaction was also examined. Abela (1991) found that people from West European countries differed according to their traditional or post-traditional orientation. Specifically, he found that people residing in Malta held the most traditional values relative to all other West European people included in the study. The main countries in descending order, according to the degree of traditional values held by the people residing in that country were: Malta, Ireland, Belgium, Italy, Holland, Britain, France, Spain, Germany, and Denmark. Abela (1991) concluded that Maltese people were more traditional. They abided by the teachings of the church, had stronger religious dispositions, and stronger family ties relative to people from other countries in Western Europe who were more post-traditional orientated. Abela's (1991) findings also showed that Maltese individuals differ on degree of traditional and post-traditional orientation.

#### **2.5142 Research with Maltese Immigrants**

There is a small yet growing body of research regarding Maltese immigrants (Aguis, 2001; Attard, 1983; Borg, 1998; Cauchi, 1990, 1999; Cauchi, Borland, & Adams, 1998; McDonald, 2000; Pascoe & Ronayne, 1997; Ronayne & Adams, 1996; Terry, Borland, & Adams, 1993; York, 1986, 1990, 1998a; Young, 1986). Much of the literature concerns the history of the Maltese immigration (Aguis, 2001; Attard, 1983; Cauchi, 1990). This literature largely consists of research conducted by Doctor Barry York with Maltese immigrants in Australia (York, 1986, 1990, 1993a, 1993b, 1997, 1998a). A major study conducted through Victoria University with the Australian Maltese community investigated issues of education, language, and identity among 486 youths and their parents (Terry et al., 1993). There is also a publication by Cauchi (1990), which discusses health among Maltese immigrants, largely based on a review of research conducted in the 1980s by the Australian Government. Two other studies, one conducted in Sydney (Australia) and another in Toronto (Canada), explored issues of cultural identity among Maltese people (Borg & Camilleri, 1995; Waitt, Galea, & Rawstone, 2001). While, Dimech (1992) highlighted the lack of culturally appropriate services available to the elderly Maltese community in Australia.

### **2.5143 Psychological Research conducted with Maltese People**

The body of published psychological research conducted with Maltese people in Malta is also in its infancy. This research largely focuses upon the fields of Neuropsychology, Educational Psychology, Psychopathology, and Organisational Psychology (Borg & Falzon, 1989; Borg, Falzon, & Sammut, 1995; Broadbent, 1984; Busuttil, 1984; Camilleri & Law, 2001; Cassar, 1999; Grattan, Brown, & Horgan, 1998; Maslowski, 1986, 1988a, 1988b; Mifsud & Borg, 1996). The area of Health Psychology remains largely unexplored as it relates to Maltese people (Muscat Baron, Muscat Baron, & Spencer, 2001). There is also very little research in Cross-cultural Psychology comparing Maltese people with people of other cultures (e.g., Bagley, 1971; Maslowski, 1986, 1988a, 1988b). Furthermore, there seems to be very few psychological studies conducted with Maltese people living outside of Malta. One is by Proctor (1998b), regarding family therapy and another is by Borg (1998), regarding psychological adjustment during adolescence, both were conducted within Australia. There may be, however, a number of other relevant unpublished studies, such as that by Gauchi (1983), regarding cognitive style and academic achievement among young Australian Maltese students. The remaining segment of this section is a summary of various Maltese cultural beliefs and practices relevant to this thesis.

### **2.5144 Aspects of Maltese Culture**

This discussion provides a perspective on Maltese beliefs and practices. First some general aspects of Maltese culture are covered (section 2.51441), and then this section will review research supporting the collective nature of Maltese culture (section 2.51442). However, in the first instance some cautionary notes will be presented.

The current view of Maltese culture is based on the, somewhat limited, research publications concerning Maltese culture. Culture is not static, therefore, it cannot be assumed that research conducted with Maltese people at one time is necessarily relevant at another time (Jary & Jary, 1991). Furthermore, Maltese people residing in Malta most probably differ from Maltese immigrants and their descendents who live in different socio-cultural contexts. There is also literature to suggest that people who reside or originate from the Maltese Island of Gozo are different from those who come from Malta. For example, the Gozitan economy largely remains based on agriculture and

fishing (Briguglio, 1995). Moreover, there are also differences between villages. For example, several dialects of the Maltese language used in Gozo are not used in Malta, and also there are dialects specific to particular villages (Aquilina, 1995). The following discussion will distinguish between research pertaining to Maltese people living in Malta from research with Maltese immigrants living elsewhere. It is beyond the scope of this study, however, to discuss regional differences, although the area warrants further investigation.

#### 2.5.1.4.4.1 General aspects of Maltese Culture

Researchers have investigated Maltese language use and what it means for the cultural identity of Maltese communities living in Australia (Terry et al., 1993). Although older Maltese people continue to speak Maltese regularly, they tend to use Maltese less with their children, and younger Maltese people tend to use more English than Maltese (McDonald, 2000; Terry et al., 1993). It may be proposed that there are historical reasons for this rapid language shift. English and before that Italian was the official language in Malta before Maltese. Maltese was not used as the main language of government and education until the 1960s, after most Maltese emigrated (Borg, 1994). Additionally, early Maltese immigration to Australia was based on a campaign that promoted the “Britishness” of Maltese people and their use of the English language (York, 1990).

Controversy surrounds the impact of Maltese language use or disuse for the Maltese community in Australia. Some argue that young Maltese Australians should be encouraged to learn Maltese because it is intimately linked with their cultural identity (Terry et al., 1993). Others argue that there are alternative areas of Maltese cultural life that continue and it is these other aspects of culture that may strengthen Maltese communal identity (York, 1998b).

Research with Maltese people, living outside of Malta, suggests that the needs of the Maltese communities seem to have not been understood or articulated within the wider communities in which they reside (Borg & Camilleri, 1995; Dimech, 1992). At the least, this lack of a voice may lead to less culturally-appropriate services and, at worst it may lead to increased mental and physical morbidity. Empirical studies have

established the importance of promoting cultural identity and social participation for the well-being of minority ethnic communities (e.g., Xing, 2001).

The post-war Maltese migrants encountered the difficulties in Australia associated with most new arrivals, such as limited financial resources, homesickness, discrimination, and cultural difference. There are, however, two unique aspects of the Maltese migration experience. First, there was a mis-perception of the Maltese people as largely Anglo-Saxon. A mis-perception rooted in Malta's British colonial history and a political campaign in Australia that falsely proclaimed Maltese people were basically British (York, 1990). Second, as Frenco (1991) argues, Maltese people in Australia continue to grapple with the psychosocial (e.g., identity) difficulties associated with colonisation, because they, largely, did not have the opportunity to celebrate Maltese culture in the socio-political context of Independence in Malta.

#### 2.5.1.4.4.2 Maltese Culture: A Collective Culture

The majority of Maltese immigrants left Malta in the 1960s, therefore, the anthropological study by Boissevain published in 1965 is particularly relevant to the present study. There have been immense socio-cultural changes in Malta since Independence in 1964. These changes were, by in large, not experienced by the Maltese who immigrated to Australia after the Second World War (Frenco, 1994). In contrast to more recent publications concerning Maltese culture, Boissevain (1965) described the socio-cultural context which many Maltese immigrants may be familiar with.

Boissevain's (1965) findings show that the organisation and celebration of the annual village patron saint days was the basis of interaction and friction between the society and government, the community and the church, between different villages, and between families and the local neighbourhood. Underlying Boissevain's (1965) analysis, is the centrality of religion to the lives of Maltese people and the collective nature of Maltese culture.

Maltese people, in particular Maltese immigrants residing outside of Malta, are still largely involved in the activities of the Roman Catholic Church, particularly parish celebrations of their patron saint. For instance, according to the 1996 Australian census, almost all the Malta-born people in Australia were Roman Catholic (93 percent) (McDonald, 2000). Moreover, research, such as that of Proctor (1998a, 1998b)

demonstrates the importance of religion to the Maltese community in Australia. Proctor (1998b) interviewed Maltese health professionals. A main theme that emerged was the connection between suffering and religious belief in Maltese culture. The religious metaphor of “bearing the cross” was used to describe how important it is to honour suffering. Courage, endurance, acceptance, and survival were integral to their descriptions (Procta, 1998b).

Similar to Boussevain (1965), more recent studies with Maltese immigrants show the collective nature of Maltese beliefs and practices. For instance, Proctor’s (1998b) findings suggest that a sense of being connected with others is an important need among Maltese people. Briffa (1998) also speaks of the saliency of family and family roles for Maltese Australians. Additionally, Waitt et al. (2001) conducted a study with Maltese immigrants and their children living in Sydney. They found that participating in Maltese cultural activities (e.g., festivals) and socialising with other Maltese people were linked to a stronger sense of Maltese identity.

The study of Abela (1991), investigating beliefs among people in Malta also illustrated the collective nature of Maltese culture. He found that Maltese people believed more in the importance of good manners, religious faith, and obedience. In contrast, people from other West European countries believed more in the importance of leadership, independence, and self-control. According to empirical research, people of collective cultures emphasise the importance of the group needs more than individual needs (Triandis, 1995).

Frendo (1991) described Maltese cultural beliefs as submissive, rather than collective: “something to do with dependence, lack of confidence, and thankfulness for small mercies” (Frendo, 1991, p. 13).

In spite of the [Maltese Australian] numbers, the appreciation and interest in Maltese culture [among Maltese Australian people] appears to be mostly limited to the more ritualistic aspects of village culture, such as festa [Patron Saint Day]... Is this because of the fact that, compared to Northern Europeans, the vast majority of Maltese who emigrated were unskilled or semi-skilled? But if so why have Greeks and Italians...been so much more successful in retaining their cultures and their language? ...Are there other reasons, more historical and even socio-psychological reasons for the Maltese [people in



Australia] being a “low-profile” community? ...is part of the reason the brainwashing of colonialism and of colonial historiography, mentalities, and manners? (Frendo, 1991, pp. 2-3).

Frendo (1991) connects this submissive, or low profile cultural, character to the long colonial history of Malta, and the parallel submission of Maltese people and culture to colonial forces. After many Maltese people had emigrated to Australia, the Independence of Malta was followed by increased appreciation and pride in the unique Maltese culture (Frendo, 1991).

### **2.515 Maltese People, Health Beliefs, and Health-related Practices**

This section will cover four topics. Firstly, some aspects of Maltese folk medicine will be discussed, food-related health practices being covered in section 2.516. The history of Western medicine in Malta will be outlined. This section will discuss perceptions of Western medical practitioners among Maltese people and it describes adherence to medical recommendations among Maltese people.

#### **2.5151 Maltese Folk Medicine**

Maltese folk or traditional medicine includes the use of herbs. Cassar (1964) provides a detailed description of cultivated medicinal plants in Malta in the 1960s. For example, *Cynomorium Coccineum*, Maltese Mushroom, was found at a place now known as “Hagra tal General” (General’s Rock) in Gozo. It was used by English settlers as a anti-venereal herb in the seventeenth century. Cassar (1964), however, provides no information about how Maltese people used the herbs. Hoareau and DaSaliva (1999) also make a general reference to the traditional use of herbal medicine, providing no specific details. Although, they do suggest that native medicinal plants continue to be used widely during recent times in Malta.

Following the introduction of Catholicism, 60 A.D., religious belief largely shaped Maltese perceptions of illness. According to Cassar (1964), many Maltese people believed supernatural forces caused illness. Illness was either perceived as sent by God, as an opportunity for them to rely on God, or sent by the devil to cause physical harm among those who have some how gone against God. Illness was addressed, therefore, through religious practices in order to receive divine assistance to either cope

with illness or restore good health. For example, nearly all the major plagues in Malta were followed by the institution of an annual votive procession, the building of chapels or shrines dedicated to one or more saint protector (Cassar, 1964).

Also discussed by Cassar (1964) was belief in the “evil eye” among Maltese people, a concept common to many other cultures. This term refers to the power alleged to be possessed by some individuals to inflict injury or produce illness by merely looking at a person whom they wish to harm for reasons of envy (Cassar, 1964; Mitchell, 2001). It has been suggested that illnesses caused by the “evil eye” are brought about by the devil, thus religious practices were also employed to treat such illnesses. For example, fragments of brown wax from the candles used during Holy Week (the week proceeding Easter) are carried around in a person’s pocket or stuck on a child’s head to prevent the harmful effects of the evil eye (Cassar, 1964). A recent study carried out by Mitchell (2000) demonstrated that youth in Malta continue to believe in the “evil eye”. Traditional Maltese beliefs in religious and supernatural causes of illness suggest that Maltese people may have strong beliefs in ‘external health locus of control’.

### **2.5152 The History of Western Medicine in Malta**

Intellectual and cultural developments in Malta, largely, reflected the evolution of ideas from West Europe, and it was also the case for the domain of medicine. By the fourteenth century, Sicilians, ruling the Islands at the time, practiced early forms of Western medicine in Malta. Sicilian doctors practiced in Malta, Maltese people studied medicine in Italian institutions, and Maltese doctors referred to Italian medical texts. During later periods, French and then British powers influenced the practice of Western medicine in Malta (Cassar, 1994). It seems that Maltese people have been using Western medicine for some time. For example, up to one hundred years ago Maltese midwives and hospital attendants, although not formally trained, assisted in hospitals and general practice. Furthermore, Malta was the hospital base for British allies during the First and Second World Wars (Cassar, 1964, 1994).

### **2.5153 Perceptions of Western Medical Practitioners among Maltese People**

During the 1900s in Malta, as in many parts of the world, the practice of Western medicine led to the treatment of infectious disease, giving rise to the Western Medical

Disease Model. According to the Medical Disease Model, a patient has a physiological dysfunction and the doctor provides a treatment or a cure. For example, Maltese physician, Doctor Themistocles Zammit, founded the diagnostic test and etiology of Brucellosis, initially known as Malta Fever. Western medicine effectively cured illness, which may have contributed to the high social standing of doctors at the time (Cassar, 1994). This was more so in Malta, because before Malta's Independence medical practitioners were part of or schooled by the colonising group of the time (e.g., Sicilian, French, or British) (Cassar, 1964, 1994).

Although there is a lack of more recent research regarding beliefs about medical practitioners among Maltese people, a study by Azzopardi (2000) is relevant to this thesis. He investigated a parents' self-advocacy group in Malta focused on parental concerns about the welfare/healthcare system relating to their children with disabilities. Azzopardi (2000) particularly discussed concepts of inclusion, exclusion, and disabling barriers in relation to the parents' perceptions of their relationship with professionals. His discussion is relevant to 'attitudes about medical doctors', 'perceived barriers to carrying out health behaviour', and beliefs about 'health locus of control' among Maltese people, variables investigated in this thesis.

The oppressive discourse from professionals makes it difficult to keep open the possibility that these two polarities can form a partnership...[there is] a lack of dialogue and interpersonal relationships...But what are parents expecting? ... [Professionals] are there to 'offer' a diagnosis and provide parents with the support necessary to develop programmes, which can enhance their children's lifestyles...Probably one of the main features...that strengthen 'inclusion'...is information [for parents] ... (Azzopardi, 2000, pp. 1068-9).

Azzopardi (2000) found that parent's of children with a disability, who participated in a parent advocacy group in Malta believed that many of their relationships with professionals were negative, even though they desired positive relationships. The parents believed that the parent-professional relationships were oppressive of parents by the professionals, and it reflected a power-struggle, based on the dominance of professional medical expertise over lay/public information. Azzopardi's (2000) findings suggest that Maltese people may hold quite negative

‘attitudes toward medical doctors’ and that ‘internal health locus of control’ may be associated with positive ‘attitudes toward doctors’.

#### **2.5154 Adherence to Medical Recommendations among Maltese People.**

There are few published studies focused on adherence to (Western) health recommendations among Maltese people, particularly with those living outside of Malta. Young (1986) demonstrated that cigarette smoking was high among Malta-born people in Australia, a tendency found common among South European-born men. Similarly, a study conducted with people in Malta, 1984, demonstrated low rates of exercise among those aged over 60 years (Cacciatolo, 1992). Further research is needed to investigate potential links between health beliefs and health behaviour among Maltese people.

A relevant unpublished thesis evaluating a preventative program for heart disease found that the diet of Maltese factory workers improved following a healthy diet intervention in the workplace (see section 2.516 for more details) (Zahra, 1998). Few published studies conducted with Maltese people investigate the health belief model, ‘health locus of control’, ‘attitudes toward medical practitioners’, ‘food beliefs’, or adherence to treatment of chronic illness.

#### **2.516 Maltese People, Food Beliefs, and Food-related Practices**

This section consists of three divisions. A description of the traditional Maltese diet and food-related customs, potential meanings of food and eating are explored, and this section will discuss empirical findings pertaining to dietary behaviour among Maltese people.

##### **2.5161 The Traditional Maltese Diet and Food-related Customs**

The mosaic of cultures in Malta’s history have influenced Maltese cookery. Traditional Maltese cuisine resembles that of Italy, with pasta as one main staple food. The other staple food is bread. It is a type of sour dough, resultant of the period of French occupation in Malta. During the period when the Knights of St. John ruled Malta they brought with them imported and exotic foods from their many countries of origin (Caruana, 1998). Maltese people, however, largely preferred fruits, vegetables, herbs, fish, and meats more traditional to Malta. For instance, broad beans, peas, cauliflower,

pumpkin, squash, tomatoes, capsicums, eggplant, onions, garlic, olives, figs, prickly pears, dates, almonds, wild mint, thyme, dill, capers, rabbit, and the fish, lampuki. Traditional Maltese dishes include, “pastizzi” (pastries filled with cheese, peas, or meat), “timpana” (baked pasta in a pastry shell), and “stuffat tal-qarnita” (octopus stew) (Caruana, 1998; Caruana Galizia & Caruana Galizia, 1972, 1999).

Maltese dishes, particularly special sweets, are linked with Christian religious traditions, such as Christmas, Easter, and the patron saint festivals. For example, “Kwarezimal” is a biscuit eaten during Lent (period before Easter) made with ground almonds and brown sugar, without eggs or milk to symbolise the personal sacrifice during the season. “Prinjolata”, iced sponge cake decorated with nuts and candy peel, is a sweet traditionally eaten around festival time (Caruana, 1998; Caruana Galizia & Caruana Galizia, 1972, 1999).

Another important aspect of traditional Maltese practices, is the use of foods as a means of maintaining or restoring good health. Even though there has been no published empirical research in this respect, some literature suggests that folk medicinal remedies make use of food stuffs, such as herbs, salt, vinegar, honey, barley, carob syrup, oranges, lemons, and the water of certain (“holy”) wells (Cassar, 1964).

#### **2.5162 Maltese Cultural Beliefs about Food**

Research examining beliefs about food and eating among Maltese people is lacking. For example, there are only a handful of cookery books focusing on traditional Maltese delicacies and culinary traditions (Caruana, 1998; Caruana Galizia & Caruana Galizia, 1972, 1999). They describe eating as an opportunity to experience pleasure, and mealtimes or cooking as opportunities to socialise, themes that are familiar to people of many cultures. For example, food is offered to visitors as a sign of hospitality among Maltese people.

#### **2.5163 Health-related Dietary Behaviour among Maltese People**

Research is lacking with respect to current food-related beliefs and practices among Maltese people. There seems very little empirical study carried out with Maltese people regarding adherence to dietary recommendations for the prevention or treatment of non-communicable diseases. One study conducted by the Department of Health in

Malta identified some unhealthy eating habits (e.g., high saturated fats) among Maltese people (Bellizzi, 1993), similar to trends apparent in many Western countries.

An unpublished study carried out by Zahra (1998) is particularly relevant to this thesis. The study was conducted with Maltese factory workers. It focused on evaluating a dietary intervention in the workplace to promote healthy eating through the factory canteen. The study measured 'beliefs about healthy food and unhealthy food', 'beliefs about the benefits of a healthy diet for the heart', 'beliefs about the barriers encountered when trying to eat healthy', 'beliefs about the severity of heart disease', 'self-efficacy beliefs' related to choosing healthy foods, and healthy food consumption.

The following findings were collected prior to the intervention. With reference to 'beliefs about food', 71.4 percent believed healthy foods were not as tasty as unhealthy foods. Regarding 'beliefs about the benefits of healthy eating for heart health', 92.9 percent believed that what one eats affected heart health, and 71.4 percent believed correctly that fibre was important to a heart health. With regard to 'barriers to healthy eating', 35.7 percent believed that choosing a healthy meal was difficult and 28 percent believed that healthy foods were more expensive than other foods. With reference to 'beliefs about the severity of heart disease', 100 percent agreed that everybody should be concerned about heart health. Concerning 'beliefs about self-efficacy in choosing health foods', 50 percent believed that they could control the type and amount of fat they consume, and 35.7 percent believed that they were capable of choosing a heart healthy meal from a menu (Zahra, 1998). Following the intervention there were some significant improvements in health beliefs and a significant increase in consumption of healthier foods, however no significant decrease in unhealthy food consumption.

Zahra's (1998) study demonstrates that the health belief model, 'food beliefs', and 'health locus of control' may be useful to explaining dietary behaviour among Maltese people. Research needs to be conducted with Maltese people residing outside of Malta.

## **2.52 Anglo-Saxon People and Culture**

This section provides a socio-cultural framework from which to understand the Anglo-Saxon community in Australia and it also demonstrates that diabetes is a serious problem for Anglo-Saxon people. Section 2.521 briefly outlines the history the United

Kingdom. It also describes the Anglo-Saxon immigration experience in Australia and some demographic data is presented. Section 2.522 presents statistics related to life expectancy, mortality, and illness among Anglo-Saxon people in Australia. Section 2.523 is a review of empirical studies concerning diabetes among Anglo-Saxon people. Anglo-Saxon beliefs and practices (section 2.524), particularly in relation to health (section 2.525) and food (section 2.526), are the topics covered in the final three sections. For the purposes of this study the term Anglo-Saxon is used to refer to people of Anglo-Celtic, Irish, Scottish, Welsh, English, and British cultural background: encompassing many diverse peoples and cultures. This section, therefore, is necessarily general, mainly discussing the similarities between these cultural groups and not their many differences. Moreover, there being a vast body of literature pertaining to Anglo-Saxon culture, health, and food, this section is a selective overview and is not designed to be exhaustive.

### **2.521 The Migration of Anglo-Saxon People to Australia and Demographic Data**

The United Kingdom is located in the North Sea, Western Europe, and consists of England, Wales, Scotland, and Ireland. Being in geographical proximity, the Isles share much common history. People have occupied Britain for over 5000 years evidenced by megalithic structures, such as that of Stonehenge, England (Fowles, 1980). Prior to 43 A.D., the inhabitants of England, Wales, and parts of Southern Scotland were called the Britons. From 43 A.D., the Romans occupied Britain. Following the weakening of the Roman Empire and the withdrawal of Roman rule from Britain in 410 A.D., the Britons looked to the Saxons, Germanic mercenaries, to maintain their security against invaders, such as the Vikings of Scandinavia. The fifth and sixth centuries, therefore, saw increased Saxon settlement in Britain, although the balance of power fluctuated over time between Britons and Saxons. With Saxon settlement in Britain, came the use of what was to become the modern English language (Flinn, 1961).

Saxon rule in England ended when the Normans defeated them in the Battle of Hastings, 1066 A.D. Norman rule effectively ensured Britain's safety against invasions thereafter. During the seventeenth, eighteenth, and nineteenth centuries Britain

expanded its empire. For example, Britain colonised Ireland, America, India, Australia, New Zealand, and parts of Africa (Flinn, 1961).

Christianity, initially Roman Catholicism, became the predominant religion in Britain at the end of the sixth century. In the fifteenth century Protestantism was established in England as result of a split from the Roman Catholic Church (Collinson, 1988).

Although not without conflict, since the 1700s Scotland, Wales, and England formed the United Kingdom of Great Britain (Flinn, 1961; Prentis, 1987). Ireland was colonised by the Anglo-Normans of Britain and became part of the United Kingdom in 1801. A long struggle in Ireland against British imperialism in the twentieth century ended with the Anglo-Irish Treaty of 1921, which established the Irish Free State. Ireland became a republic at the end of World War II, while Northern Ireland remained part of the United Kingdom (Cronin, 2001).

Britain colonised Australia as a penal settlement in 1788 and began colonizing Aboriginal communities. The convicts, crew, officers, and guards who arrived in Australia at this time were mainly people of the United Kingdom. Convict transportation gradually declined in the early nineteenth century and free settlement from the United Kingdom made up the majority of immigration to Australia. For example, gold discoveries in the 1850s and 60s generated a leap in economic development and prosperity, attracting an influx of immigrants from the United Kingdom. The state of Victoria, where data for this thesis was collected, was settled predominantly following gold discoveries starting in the early 1850s and was never a convict colony. Like their many reasons for migrating, socio-economic levels of these early arrivals to Australia from the United Kingdom were wide and varied (Macintyre, 1999).

Early colonial emigration from Ireland was most probably because of ongoing issues related to overpopulation, such as the Great Potato Famine in the mid 1800s, poor socio-economic conditions in the face of British imperialism, socio-political conflict between the Catholic and Protestant people, and high unemployment due to economic depression. For instance, it has been estimated that between 1845 and 1849 during the Great Famine a million and a half Irish people died and a further one million emigrated (Greenslade, 1992). Others may have left Ireland for personal, circumstantial, and



professional reasons. Many Irish doctors came to Australia in the 1800s seeking better career prospects (Geary, 1992). A major reason why some Irish and British people chose to immigrate to Australia was the policies implemented by the British government to encourage private capital investment in Australia's newly established pastoral industry (Forth, 1992).

Scottish people began immigrating to Australia at the turn of the eighteenth century. They were motivated by economic and socio-political problems in Scotland and were also encouraged by British government policies. Between 1861 and 1911 nearly three quarters of the Scottish population emigrated and Australia was a favoured destination (Prentis, 1987).

For most of Australia's history those of Anglo-Saxon origins have made up a considerable proportion of Australia's population. Both in 1891 and 1998 those of Anglo-Saxon origins (migrants and their descendents) made up about 70 percent of the Australian population (Price, 2000). This is a substantial proportion considering the increased immigration from other parts of the world after World War II. In 1998, of those people with Anglo-Saxon origins, English comprised 40.2 percent, Irish 16.4 percent, Scottish 11.3 percent, and Welsh 1.3 percent (Lucas, 2000b; Price & Khoo, 1996; Price, 2000).

Most migration from the United Kingdom to Australia occurred prior to 1971, particularly during the nineteenth and early twentieth centuries; therefore the following demographic data concerning the Britain-born and Ireland-born immigrants residing in Australia in 1996 are limited (Lucas, 2000b). People of Anglo-Saxon origin born in Australia were not considered exclusively in the 1996 census.

In 1996 approximately 20 to 30 percent of people in Australia born in United Kingdom or Ireland were between the ages of 45 and 65, or 65 and over. Of the second generation, those Australia-born persons with parent/s born in the United Kingdom or Ireland, around 30 to 40 percent were aged 45 and over (Lucas, 2000a, 2000b).

Of the Ireland-born population in 1996, 0.2 percent had never attended school and 18.8 percent left school before age 15. Of the United Kingdom-born population, a negligible amount never attended school and 17.5 percent left school before reaching 15 years. Comparatively, one percent of the Australia-born population never attended school and 15.5 percent left before 15 years of age. The number of Ireland-born and

United Kingdom-born people in Australia employed in professional positions was very similar to the Australia-born population (Lucas, 2000a, 2000b).

According to the 1996 census, the majority of the Ireland-born population was Roman Catholic (72.9 percent) and a further 9.6 percent was Protestant (Anglicans, Presbyterians or of the Uniting Church). In 1996 of those people residing in Australia who were born in the United Kingdom 53.5 percent were Protestant, particularly Anglican, and 12 percent were Catholic. The proportion of United Kingdom-born who reported having no religion was 18.9 percent and among Ireland-born it was 8.3 percent (Lucas, 2000a, 2000b).

### **2.522 The Health of the Anglo-Saxon Community in Australia**

This section will cover health-related statistics for the general Australian population in comparison with other Western countries. It will also cover health statistics describing the Australia-born population in comparison with United Kingdom-born and Ireland-born immigrants residing in Australia. Young's (1986) study regarding immigrant mortality is the major focus, because his results include statistics that describe both Anglo-Saxon and Maltese people (see section 2.512).

Estimates of life expectancy for the period of 2000 to 2005 for the general Australian male population is 76.0 years of age and for females it is 81.6 years of age. This is comparable to other Western countries, such as the United States (males 74.2, females 80.6) and the United Kingdom (males 75.3, females 80.6). With reference to the mid 1990s, standardised death rates demonstrate that chronic illness, specifically Malignant Neoplasms (cancer), Ischaemic Heart Disease, and Cerebro-vascular Disease (stroke), were the top causes of death among the Australian population, the population of the United States, and the population of the United Kingdom (World Health Organisation, 1995, 1996, 1998, 2000).

Studies have generally found that people in Australia born overseas are of better health on arrival than Australia-born people, most probably because good health is a criterion to migrate. However, the initial good health of migrants who have emigrated from the United Kingdom, or from elsewhere, decreases with increased duration of residency in Australia (Young, 1986). For instance, Young (1986) found all immigrants, including Anglo-Saxon people, had lower mortality rates than people who were born in

Australia, and that age-specific immigrant mortality rates increased over time spent in Australia.

Young (1986) also found that Australian immigrants born in England and Wales had similar mortality rates to Malta-born immigrants, yet higher mortality rates than most other immigrant groups of Southern Europe. Moreover, mortality rates among England-born and Wales-born immigrants in Australia were found to be lower than that of Scotland and Ireland-born immigrants.

Illness rates among Anglo-Saxon people in comparison with Australia-born people depend on the illness under consideration. For example, Young (1986) found that English, Welsh, Scottish, and Irish immigrants in Australia have higher mortality rates associated with cancers than Australia-born; whereas Anglo-Saxon immigrants experienced less death from diseases of the respiratory system, Ischaemic Heart Disease, and Diabetes relative to people who were born in Australia.

### **2.523 Diabetes Prevalence and Treatment Adherence among Anglo-Saxon People**

The prevalence of diabetes is generally high among people living in Western industrialized societies (McCarty et al., 1996; Seidall, 2000). People of Northern Europe experience less diabetes prevalence than those from Southern Europe, a trend apparent in Australia (Australian Bureau of Statistics, 1995). Studies show that adherence with treatment recommendations among diabetes patients is generally low, however adherence among people of Anglo-Saxon origins is relatively high compared to people of other ethnic groups (Auslander, Thompson, Dreitzer, White, & Santiago, 1997; Chalew et al., 2000).

### **2.524 Anglo-Saxon People, Beliefs, and Practices**

There has been extensive psychological and cultural research conducted to compare the beliefs and practices of Anglo-Saxon people with other ethnic groups, particularly with people of Asian, Black, and Indigenous cultures (Brislin, 1990; Hernandez & Charney, 1998). Less research has been conducted to compare Anglo-Saxon of a North European background with people of Southern Europe, particularly in regards to Maltese people. This section is a brief discussion of Anglo-Saxon culture,

particularly with reference to the study by Abela (1991) (refer to 2.514), which contrasted the values held by people from Northern Europe with Southern Europeans.

Most comparative research demonstrates that Anglo-Saxon cultures are generally individualistic (Berry et al., 2002). Studies of this type mainly compared Anglo-Saxon cultures to Asian, Black, and Southern European cultures. Abela's (1991) study of European values suggested that people of the United Kingdom held more post-traditional (individualistic) values than people from Italy and Malta. They were less attached to religion, they had weaker family ties, and they valued leadership, independence, self-control, and determination more than the traditional (collective) values of obedience, patience, and good manners. Abela (1991) also found that people of Southern Ireland were more traditional than people of the United Kingdom (England, Scotland, Wales, and Northern Ireland).

### **2.525 Anglo-Saxon People, Health Beliefs, and Health-related Practices**

This section will include three topics. Some aspects of Anglo-Saxon folk or traditional medicine will be covered. The history of Western medicine will be briefly outlined (section 2.5251), and assumptions regarding medical practitioners inherent in the Western Medical Disease Model will be discussed (section 2.5252). The final section describes adherence to Western medical recommendations among Anglo-Saxon people (section 2.5253).

#### **2.5251 The History of Western Medicine**

Relative to the vast amount of research pertaining to the history of Western medicine, there is little research concerning traditional or folk medicine among Anglo-Saxon people. This is not to say that traditional Anglo-Saxon health practices do not continue to be utilised. Recent research shows that professional medical perspectives are distinct from lay perspectives on health and illness (Bishop & Converse, 1986; Schoenberg et al., 1998; Williams, 1983). In contrast to some other cultures, Anglo-Saxon medicine is more aligned with Western medicine, because much of mainstream health practices or Western medicine originated in Northern Europe (Porter, 1997). For example, Spector (1991) surveyed students regarding family home remedies and found that British, Irish, and French people shared similar health maintenance practices, such as good diet, plentiful sleep, daily exercise, cleanliness, and keeping warm or dry.

Chicken soup, tea and honey, lemon and/or whiskey, and hot milk were used frequently as home cures. Among British and Irish people in particular there was a generalised belief that good health was dependent upon a proper attitude (e.g., in a religious or moral sense) and a rigorous regular lifestyle.

### **2.5252 Medical Practitioners and the Medical Disease Model**

One of the key physiological doctrines in early Western medicine originating in Greece was that the human body, like the natural world, was composed of a small number of elements combined to form temporarily stable mixtures. Health was viewed as an equilibrium and illness an upset of this balance. What were being kept in balance were humours (i.e., blood, yellow bile, black bile, and water), bodily fluids, which would be concentrated in one body zone to cause illness. For example, excess fluid concentrated in the lungs from the head was said to be the cause of coughing (Porter, 1997).

The early Western Medical Model viewed the human body as a microcosm. Like the natural world, the human body was seen as an ordered universe made up of functional parts. In contrast, many traditional models of healing had an important religious element and the natural world, community, body, mind, and soul were seen to be in harmony in the state of good health (Porter, 1997).

Hippocratic medicine, founded approximately 400 B.C. in Greece, was the basis of Western medicine. In contrast to the preceding healing systems in Europe, Hippocratic medicine disagreed with the theories that advocated divine or supernatural origins of illness, and was built upon natural theories of illness etiology, which could be demonstrated empirically. From its inception, Western medicine created a split between expert knowledge and lay knowledge. According to Porter, Hippocratic doctors (intellectuals) viewed the medicine they practiced as opposed and superior to that of traditional healers (religious). A paradox in Hippocratic Medicine was that nature not doctors was originally attributed the power of healing (Porter, 1997).

Later, physicians opposed the theories of Hippocrates, crediting doctors not nature with the power to heal. It was believed that doctors acquired the knowledge and applied the skills of medicine. So emerged the Western Medical Disease Model. In the early years A.D., doctors would dissect animals and use that knowledge to understand

the human body, because human dissection was initially considered unethical. During the sixteenth century the bodies of deceased (executed) criminals were used for medical research (Lane, 2001; Porter, 1997).

The power or authority of Western Medicine and medical doctors to heal was particularly reinforced during the eighteenth, nineteenth, and twentieth centuries with the discovery of penicillin to cure infectious disease, the invention of inoculations to prevent disease, and the development of marvelous surgical technology. Furthermore, entwined in the successful history of Western Medicine was colonisation carried out by the Western world. Western medicine, like other aspects of Western culture, became part of the dominant culture and alternative health practices were considered subordinate. The military and political power of the colonisers may have added to the perceived power of Western medical practitioners (Cunningham & Andrews, 1997; Macleod & Lewis, 1988; Porter, 1997).

Due to the success of medicine in the treatment of fatal disease people began to live longer and chronic illness increased. The successful treatment of chronic illness required long-term treatment that was more reliant on the actions of the patient. Therefore, at the turn of the twentieth century there was a shift in the Western Medical Model. The shift was from the earlier Medical Disease Model based on a paternalistic patient-doctor relationship, where the doctor provided a cure and the patient occupied a child-like position; toward the more recent Health Promotion Model based on a partnership between patient and doctor, where the doctor provided a professional opinion and the patient participated more in the healthcare process (Allen, 1998; Lane, 2001; Macleod & Lewis, 1988; Porter, 1997).

Most medical milestones have revolved around the effectiveness of drugs and human-made technologies to treat illness. Therefore, traditionally in the Western Medical Disease Model long-term treatment has constituted the use of prescribed pharmaceuticals. With the increase in chronic illness predominantly perpetuated and treated with changes in lifestyle the traditional focus upon pharmaceutical treatment also shifted. Diet, exercise, and other lifestyle factors became more central to medical treatment. These shifts in the medical paradigm, from a paternalistic to a partnership and from pharmaceuticals to lifestyle, have not occurred without difficulty and resistance. Perhaps, these shifts are part of the reason why adherence to treatment is a

problem among people who have a chronic illness, because patients and professionals have found it difficult to shift roles (Allen, 1998; Kelly, 2000; Porter, 1997).

### **2.5253 Adherence to Medical Recommendations among Anglo-Saxon People**

Research conducted with the general Australian population has been largely conducted with people of Anglo-Saxon ethnic origins, and this such research forms the basis of this discussion. Although recent studies show that the use of alternative, folk, or traditional medicines is increasing (Alberts, Sanderman, Eimers, & Heuvel, 1997; James, Fox, & Taheri, 1983; Maclennan, Wilson, & Taylor, 1996), according to the 1989 to 1990 National Health Survey mainstream medicine is used by a majority of the Australian population. For example, for people aged 45 and over, 600 to 800 people in every 1000 reported having used medication in the two weeks prior to the survey. Almost 30 percent of the sample consulted with a doctor during the proceeding two weeks, whereas two percent consulted with a herbalist, naturopath, or acupuncturist. However, the high use of pharmaceutical medication and consultation with medical doctors is no indication of treatment adherence (Australian Bureau of Statistics, 1991).

The Australian National Health Survey, in 2001, showed that lifestyle risk factors for developing chronic illness were high, even though the amount of health information available increased. For example, approximately 22 percent of the sample smoked, approximately 70 percent of the sample did no or a low level of physical activity, and 38 percent of participants considered themselves as overweight (Australian Bureau of Statistics, 2001, pp. 8-10).

### **2.526 Anglo-Saxon People, Food Beliefs, and Food-related Practices**

This section consists of three divisions: A description of the traditional Anglo-Saxon diet (section 2.5261), beliefs related to food in Anglo-Saxon culture (section 2.5262), and lastly this section discusses empirical findings pertaining to dietary behaviour among Anglo-Saxon people (section 2.5263).

#### **2.5261 The Traditional Anglo-Saxon Diet**

In the traditional Anglo-Saxon diet meat, poultry, or fish are usually the centerpiece of the meal with vegetables, especially potatoes, as an accompaniment. Wheat bread is also often eaten with a meal. Meals are generally roasted or broiled, or

prepared as stews or pies. Smoked, salted, or dried fish is quite popular. Dairy products (e.g., cheese) form a main component of the traditional Anglo-Saxon diet. The most common beverages are tea, coffee, beer, wine, and whiskey. Plum pudding and trifle are traditional sweet dishes. Traditional fruits include apples, oranges, plums, prunes, rhubarb, strawberries, and melons. Traditional vegetables are asparagus, carrots, beans, mushrooms, radishes, spinach, onions, lettuce, peas, potatoes, and brussel sprouts (Kittler & Sucher, 1998; Mennell, 1996).

### **2.5262 Anglo-Saxon Cultural Beliefs about Food**

As in many cultures, within traditional Anglo-Saxon practices eating has remained a mode of socialising and celebration, a way of communicating moral code, and a means of maintaining or restoring health. For example, Mennall's (1996) analysis describes the importance of food choices and taste preferences throughout history in respect to French fashion and the English social hierarchy. Particularly prior to the nineteenth century, the manner, quantity, and time people ate were signs of social status or social grouping.

Eating habits have meanings related to morality in Anglo-Saxon culture. For example, throughout English history different qualities and quantities of food have suggested negative and positive meanings about the eater's righteousness or immorality. According to Mennall's (1996) discussion about eating and taste in Northern Europe, past Christian teachings in regards to the wrongfulness of gluttony and customs encouraging fasting suggested that overeating was morally wrong and exercising restraint was good (Banks, 1992). Moral connotations of food and eating in traditional Anglo-Saxon culture seem to be still apparent in mainstream Western cultures. For example, the focus of Western Medicine upon the dietary etiology of illness seemingly asserts that there are healthy good food choices and unhealthy bad food (Mennell, 1996; Rozin, Ashmore, & Markwith, 1996).

Similar to other cultures, food had a place in traditional Anglo-Saxon medicine (see section 2.5251 for examples). Hippocratic medicine was very much focused on dietary treatment. However, over time diet became increasingly peripheral to Western Medicine. Pharmaceutical and surgical treatments remained the focus until the recent rise in chronic illness brought the focus upon dietary treatments. In many traditional



healing systems eating specific foods was largely perceived as illness treatment, whereas, until recently, Western medicine viewed a nutritional diet as maintaining health but not a legitimate treatment for illness (Kelly, 2000; Porter, 1997).

### **2.5263 Health-related Dietary Behaviour among Anglo-Saxon People**

Dietary behaviour among Anglo-Saxon people have been investigated by the Australian Bureau of Statistics (1997). It was found that in 1993 and 1994 eating habits were changing in the direction of recommended dietary intakes (e.g., less fat and sugar consumption, more fruit and vegetable consumption). However, the available supply or demand exceeded the recommended dietary intake for all nutrients. This suggests that adherence to healthy diet recommendations was lower than desirable in the Australian population.

### **2.53 Ethnicity and the Proposed Diabetes Adherence Model**

An aim of this study was to contrast Maltese and Anglo-Saxon people with Type II Diabetes on health beliefs and treatment adherence. This makes for an interesting comparison due to the absence of research into the differences between Anglo-Saxon and Maltese people. As demonstrated in section 2.4, research suggests that people of more collective cultures or minority ethnic groups, such as Maltese Australians, differ in their health beliefs from people of more individualistic cultures or majority ethnic groups, such as Anglo-Saxon Australians. This thesis is the beginning of empirical research designed to determine the specific differences in health beliefs and practices between Maltese and Anglo-Saxon communities. The detailed account, in section 2.5, regarding Maltese and Anglo-Saxon socio-cultural experiences in Australia, may serve to frame these comparisons.

### *2.6 Statement of the Hypotheses*

This thesis proposed that;

- 1) Patient beliefs about treatment, beliefs about healthcare, and beliefs about the illness would be significant predictors of diabetes treatment adherence (see figure 2).
- 2) There would be significant predictive relationships between patient beliefs about treatment, patient beliefs about healthcare, and patient beliefs about the illness of diabetes (refer to figure 2).

3) There would be significant differences on health beliefs and diabetes treatment adherence between Maltese Australian and Anglo-Saxon Australian patients.

### 3 Methodology

This chapter details the steps taken to conduct the study. It describes the research participants (section 3.1), the questionnaire used (section 3.2), the procedure (section 3.3), and the statistics employed in the data analyses (section 3.31).

#### 3.1 Participants

People with diabetes were asked to participate in the study when they attended Diabetes Australia, Sunshine, situated in the Western Metropolitan Region of Melbourne in Victoria. Diabetes Australia is a Government funded service, which provides self-care products and education about treatment to people who have been clinically diagnosed with Diabetes Mellitus. Participant recruitment took place over a five-month period.

Participants were selected based on the following two criteria: 1) The person was diagnosed with Type II Diabetes Mellitus or diagnosed with Diabetes Mellitus after 30 years of age; and 2) one or both the person's parents were of Anglo-Saxon origin (born in Australia, England, Scotland, Ireland, or Wales) or of Maltese origin (born in Malta).

The questionnaire was distributed to 387 people of which 147 (38 percent) responded. Thirty-six percent of the Anglo-Saxon people who accepted a questionnaire returned it completed and the response rate for the Maltese group was 41 percent. The sample comprised of 69 women, 74 men, and 4 participants who did not report their gender. Their ages ranged from 31 to 80 years. The mean age was 61 years and the median age 62 years.

Eighty-four percent of the sample reported having Type II Diabetes and 16% did not report the Type of Diabetes. Of the 16% unreported cases, 20 out of 24 participants indicated that their doctor prescribed tablets only or both tablets and insulin injections to treat their diabetes. Furthermore, all of the unreported cases comprised of participants who were diagnosed with diabetes when they were over 30 years of age. Therefore, it may be concluded that the participants who did not report the type of diabetes most likely had Type II Diabetes Mellitus.

Ninety-eight participants in the sample were of Anglo-Saxon origin and 49 were of Maltese origin. The sample characteristics are presented separately for Maltese and Anglo-Saxon people in table 1.

Table 1

## Characteristics of the Maltese Sample and the Anglo-Saxon Sample

|  | <b>Maltese (n = 49)</b>                                | <b>Anglo-Saxon (n = 98)</b>   |
|--|--|---|
| <u>Place of Birth</u>                          | Malta-born = 100%                                      | Australia-born = 78%<br>England-born = 17%<br>Ireland-born = 2%<br>Scotland-born = 3% |
| <u>Age</u>                                     |  |   |
| - Age Range                                    | 45 to 80 years   | 31 to 78 years  |
| - Mean Age                                     | 63 years   | 61 years  |
| - Median Age                                   | 63 years   | 62 years  |
| <u>Gender</u>                                  | Women = 55%<br>Men = 45%                               | Women = 43%<br>Men = 54%<br>Unreported = 3%   |
| <u>Mean Years Residing in Australia</u>        | 39 years   | 55 years  |
| <u>Education</u>                               |  |   |
| - Never attended School or Incomplete Primary  | 35%  | 4%  |
| - Incomplete Secondary                         | 31%  | 28%   |
| - Completed Secondary                          | 14%  | 22%   |
| - Certificate/Diploma                          | 8%   | 14%   |
| - Tertiary                                     | 0%   | 7%  |
| - Postgraduate                                 | 2%   | 3%  |
| - Unreported                                   | 10%  | 22%   |
| <u>English Proficiency</u>                     | A little = 16%<br>Fairly Well = 29%<br>Very Well = 55% | A little = 0%<br>Fairly Well = 3%<br>Very Well = 97%                                  |
| <u>Mean Number of Diabetes Complications *</u> | 1  | 1   |
| <u>Mean Years Since Diagnosis</u>              | 11 years   | 9 years   |

\* Diabetes complications include high blood pressure, eye disease, kidney disease, aching legs, numbness in the feet, heart disease, and gangrene

### 3.2 *Instruments*

Data for this study were collected via a paper and pencil survey consisting of four questionnaires, demographic information, and clinical parameters. Other instruments were included in the questionnaire, but were excluded from the analyses (see section 4.11). This section provides information about the instruments used, scale reliability and scale validity.

#### **3.21 Demographic Data and Clinical Parameters**

Data was collected relating to gender, age, level of education, years residing in Australia, proficiency in English, age when diagnosed with diabetes, and type of treatment regimen (insulin, tablets, or no medication) (appendix 1). The number of diabetes complications was obtained through the instrument used to measure 'perceived vulnerability to developing complications of diabetes' (see section 3.25). It contained an option to indicate that the participant has already developed specific diabetes complications, such as high blood pressure, eye disease, kidney disease, aching legs, numbness in the feet, heart disease, and gangrene (see appendix 8). Other data obtained using the Beliefs about Vulnerability sub-scale were excluded from the analyses (refer to section 4.11).

#### **3.22 Adherence to Diabetes Treatment**

The Summary of Diabetes Self-care Activities Questionnaire (SDSQ) indicates how frequently a person engages in diabetes regimen tasks (Marquis & Ware, 1979) (appendix 2). The instrument is comprised of four sub-scales and three were used in the survey: the Food Behaviour subscale is indicative of dietary treatment adherence, the Glucose Testing Behaviour sub-scale is indicative of home blood glucose monitoring, and the Medication Behaviour sub-scale is indicative of medication adherence. The Food Behaviour sub-scale was the only one included in the analyses (see section 4.11).

Minor modifications were made to the SDSQ to simplify the response format. The original response format required participants to report the percentage of time during the prior seven days spent engaged in each regimen task (Marquis & Ware, 1979). In this thesis a 5-point Likert Scale (Never to Always) was used to indicate the frequency of dietary treatment adherence.

Concurrent validity has been demonstrated by significant correlations between SDSQ scores and other similar measures (Toobert & Glasgow, 1994; Toobert, Hampson, & Russell, 2000). According to a review of seven studies conducted by Toobert and Glasgow (2000) with a total sample of 1,988 people, inter-item reliability (Cronbach's Alpha) of SDSQ sub-scales were acceptable (mean = .47). However, Cronbach's Alpha levels were low for the food behaviour sub-scale (range = 0.07 to 0.23). This may be attributed to the problematic response format modified in this study. According to the present results (section 3.26) the inter-item reliability for the SDSQ Food Behaviour sub-scale was higher (Cronbach's Alpha = 0.71) relative to previous findings. This may be, in part, due to the simplified reporting format.

### **3.23 Beliefs about Treatment**

#### **3.231 Perceived Barriers to Treatment**

The Experience of Treatment Benefits and Barriers Scale (Lewis, Jennings, Ward, & Bradley, 1990) consists of 10 items, five items pertain to 'perceived benefits of diabetes treatment' and five items apply to 'perceived barriers to carrying out treatment' (appendix 3). The variable 'perceived benefits of diabetes treatment' was excluded from the analyses (refer to section 4.11). 'Perceived barriers to diabetes treatment' was included in the analyses, and is indicative of personal and social costs of adhering to diabetes treatment. Respondents indicated on a 7-point Likert Scale the extent to which they agreed or disagreed with each statement.

Lewis et al.(1990) found the scale separated into two factors and had good reliability. Cronbach's Alpha levels were moderate to high for both the 'perceived benefits of treatment' sub-scale (0.79) and the 'perceived barriers to treatment' sub-scale (0.67).

#### **3.232 Beliefs about Food**

Six questions were used to explore 'food beliefs' related to healthy eating and the taste of food (appendix 4). A Principal Component Factor Analysis was conducted to create one synthetic 'food belief' variable to use in the analyses, described in section 4.12.

### **3.24 Beliefs about Healthcare**

#### **3.241 Attitudes toward Medical Doctors**

Marteau (1990) constructed the Attitudes towards Doctors and Medicine Scale (appendix 5). It measures positive and negative attitudes toward medical doctors and medicine. Only the two sub-scales indicative of ‘positive attitudes toward doctors’ (5 items) and ‘negative attitudes toward doctors’ (5 items) were included in this study. The respondents rated their agreement or disagreement with each statement on a 6-point Likert Scale (strongly disagree to strongly agree).

Marteau (1979) demonstrated that the scale was reliable. The Cronbach’s Alpha level was 0.76 for ‘positive attitudes toward doctors’ and 0.67 for ‘negative attitudes toward doctors’. Test-retest reliabilities over a three-day interval exceeded 0.77 in regards to the two sub-scales (Marteau, 1990).

#### **3.242 Health Locus of Control**

The Multi-dimensional Health Locus of Control Scale, Form A (MHLC) (Wallston et al., 1978) consists of 18 items and was used in this study to measure ‘internal health locus of control’, ‘powerful-others health locus of control’, and ‘chance health locus of control’ (appendix 6). Respondents indicated on a 7-point Likert scale how strongly they agreed or disagreed with each statement.

As found by Wallston et al. (1978), alpha reliabilities for each of the scales ranged from 0.67 to 0.77, and significant relationships were found between MHLC sub-scales and similar measures. The instrument has been used extensively with clinical and non-clinical populations (Wallston & Wallston, 1981).

### **3.25 Beliefs about the Illness**

The variables ‘perceived severity of diabetes’ and ‘perceived susceptibility to developing diabetes complications’ were excluded from the data analyses (see section 4.11). The 18-item Beliefs about Severity Scale measures the perceived severity of diabetes, of diabetes complications, and other comparable physical conditions (appendix 7) (Lewis et al., 1990). Respondents rated the seriousness of each condition on a 5-point Likert Scale (not serious at all to extremely serious).

The 18-item Beliefs about Vulnerability Scale measures the patient’s perceived susceptibility to developing diabetes complications and other physical conditions

(appendix 8) (Lewis et al., 1990). Respondents rated the likelihood that they will develop each condition on a 5-point Likert Scale (very unlikely to very likely).

### 3.26 Scale Reliability

The instruments employed in this study were found to be reliable. Cronbach's Alpha was used to evaluate the internal consistency of each scale (see table 2). All of the scales used in the analyses had a Cronbach's Alpha level over 0.70, with the exception of 'barriers to carrying out treatment', 'chance health locus of control', and 'negative attitudes toward doctors'. In general, a scale should have a Cronbach's Alpha of 0.70. However, an alpha level of 0.60 or lower is sometimes considered adequate, because the risk is levelled out by the difficulty to obtain a statistically significant relationship between a variable with low reliability and other variables (Hair et al. 1992; Aron & Aron, 1999). All of the scales had a Cronbach's Alpha of at least 0.60, except 'internal health locus of control'.

The Cronbach's Alpha for 'internal health locus of control' was improved markedly (from 0.38 to 0.70) when one item was removed. Therefore, 'internal health locus of control' scores, minus the low alpha item, were used in subsequent analyses.

There were high correlations between the six questions pertaining to 'food beliefs'. This is evidenced by the high loadings for all items on one factor in the Principle Component Factor analysis (see section 4.12).

### 3.3 Procedure

Permission to carry out the study was granted by the Victoria University Human Research Ethics Committee (appendix 9). Permission was also obtained from Diabetes Australia to carry out recruitment and questionnaire administration on the premises (appendix 10). Copyright permission was obtained to use the 'Beliefs about Severity Scale', the 'Beliefs about Vulnerability Scale', and the 'Experience of Treatment Benefits and Barriers Scale' (appendix 11). Written permission was not needed to use the other standardised measures.

The researcher made face-to-face contact with participants at Diabetes Australia. People who were interested in the study were asked to participate if they met the selection criteria. Participants were provided with a questionnaire, plain language statement (see appendix 12), consent form (see appendix 13), and a postage paid envelope. Questionnaires were returned by mail.



Table 2

Scale Reliability: Cronbach's Alpha Coefficients

| Scale  | Cronbach's Alpha |
|--|------------------|
| <b>Summary of Diabetes Self Care Activities Questionnaire</b>  |                  |
| Dietary Adherence subscale                                     | 0.71             |
| <b>Experience of Benefits and Barriers Scale</b>               |                  |
| Barriers to Treatment subscale                                 | 0.68             |
| <b>Attitudes toward Doctors and Medicine Scale</b>             |                  |
| Negative Attitudes toward Doctors subscale                     | 0.49             |
| Positive Attitudes toward Doctors subscale                     | 0.76             |
| <b>Multi-dimensional Health Locus of Control Scale, Form A</b> |                  |
| Internal Health Locus of Control (excluding low alpha item)    | 0.70             |
| Powerful-others Health Locus of Control                        | 0.79             |
| Chance Health Locus of Control                                 | 0.63             |

### 3.31 Statistical Analyses

Prior to testing the hypotheses, Kolmogorov-Smirnov tests were used to identify the variables with non-normal distributions. Skewed variables were either corrected with data transformations or excluded from the statistical analyses (see section 4.11 for details).

Second, a factor analysis was conducted to obtain the 'food beliefs' variable (section 4.12). Third, Cronbach's Alpha levels were calculated for all standardised scales included in the data analyses in order to assess inter-item reliability (see section 3.26).

Multiple Regression Analyses were employed to investigate the predictive relationships between health beliefs and diabetes treatment adherence (hypotheses 1 and 2 reported in sections 4.21 and 4.22). Multivariate Analyses of Variance was utilised to investigate ethnic differences in health beliefs and diabetes treatment adherence (hypothesis 3 reported in section 4.23). In addition, descriptive statistics calculated for all variables by ethnic group are featured in appendix 14.

## 4 Results

The purpose of this study was to determine the health beliefs associated with treatment adherence among Maltese and Anglo-Saxon people with diabetes. The results focus upon dietary treatment adherence, ‘beliefs about treatment’ (‘food beliefs’, ‘benefits of and barriers to treatment’), and ‘beliefs about healthcare’ (‘attitudes toward doctors’, ‘health locus of control’). There are three main points that coincide with the hypotheses. First, dietary adherence was predicted by age and ‘beliefs about treatment’ (hypothesis 1). Second, there were predictive relationships found between ‘beliefs about healthcare’ and ‘beliefs about treatment’ (hypothesis 2). Third, it was found that Maltese and Anglo-Saxon patients held different ‘beliefs about healthcare’ (hypothesis 3). The following chapter defines the variables included in the analyses (section 4.1) and addresses each of the research hypotheses (section 4.2).

### 4.1 *The Variables*

#### 4.11 **Data Transformation**

Kolmogorov-Smirnov assessment of normality (table 3) revealed that all, but one, of the variables constituting ‘beliefs about the illness’ were skewed and could not be corrected using data transformation techniques. Non-normality detracts from the ability of the correlation coefficient to represent the relationship of the skewed variable to another variable (Hair, Anderson, Tatham, & Black, 1995). Therefore, all the ‘beliefs about the illness of diabetes’ were eliminated and not examined in this study.

Medication adherence and adherence to home blood glucose monitoring also had non-normal distributions that could not be corrected statistically, therefore both variables were eliminated from the analyses. Take note that two Kolmogorov-Smirnov tests were conducted for medication adherence: one included the responses of those patients who took tablets to treat their diabetes and one was conducted for participants who took insulin.

Table 3

Normality of Distributions: Kolmogorov-Smirnov Tests before Data Transformations

| Variable  | Kurtosis | Skewness | K-S Test | Sig. p. |
|---|----------|----------|----------|---------|
| + <u>Dietary Adherence</u>  | 1.123    | -0.949   | 1.562    | 0.015   |
| <u>Medication Adherence</u>   |          |          |          |         |
| - Tablet-taking   | 1.377    | -1.602   | 3.530    | 0.00    |
| - Insulin-taking  | -1.024   | -0.972   | 1.429    | 0.034   |
| + <u>Home Blood Glucose Monitoring</u>  | -0.903   | -0.490   | 2.211    | 0.00    |
| <u>Barriers to Treatment</u>  | -0.519   | -0.061   | 0.850    | 0.466   |
| + <u>Benefits of Treatment</u>  | 1.832    | -1.332   | 1.876    | 0.002   |
| <u>Food Beliefs</u><br>(variable resulting from<br>factor analysis, see section 4.12) | -0.371   | 0.410    | 0.627    | 0.827   |
| <u>Internal Health Locus of Control</u>   | -0.048   | -0.293   | 0.652    | 0.789   |
| <u>Powerful-others Health Locus of Control</u>  | -0.098   | -0.495   | 1.280    | 0.075   |
| <u>Chance Health Locus of Control</u>   | 0.020    | 0.401    | 0.891    | 0.405   |
| <u>Positive Attitudes toward Doctors</u>  | -0.597   | -0.157   | 0.816    | 0.519   |
| <u>Negative Attitudes toward Doctors</u>  | -0.608   | 0.225    | 1.107    | 0.172   |
| <u>Susceptibility to (specific) Diabetes<br/>Complications</u>                        | -0.987   | -0.446   | 1.954    | 0.271   |
| + <u>Susceptibility to Diabetes<br/>Complications in General</u>                      | -0.294   | 0.626    | 0.999    | .001    |
| - <u>Susceptibility to General Disorders</u>  | 0.098    | 0.896    | 1.390    | 0.042   |
| + <u>Severity of Diabetes</u>   | 0.033    | -0.860   | 1.940    | 0.001   |
| + <u>Severity of Specific Diabetes<br/>Complications</u>                              | 6.357    | -2.646   | 3.251    | 0.00    |
| + <u>Severity of General Disorders</u>  | 1.851    | -1.203   | 1.845    | 0.002   |

**Abbreviations**

+ denotes positively skewed variables

- denotes negatively skewed variables

**Tablet-taking** refers to the one item referring to how often a person prescribed tablets takes the tablets recommended by his/her doctor.

**Insulin-taking** refers to the one item referring to how often a person prescribed insulin has the insulin recommended by his/her doctor.

Kolmogorov-Smirnov assessment of normality showed that dietary adherence was positively skewed, however a square-root adjustment corrected this. The transformed variable constituted diabetes treatment adherence in the analyses (refer to table 4 below).

Table 4

Normality of Distribution: Kolmogorov-Smirnov Test for Dietary Adherence following Square Root Transformation

| Variable          | Kurtosis | Skewness | K-S Test | Sig. p. |
|-------------------|----------|----------|----------|---------|
| Dietary Adherence | -0.220   | -0.230   | 1.111    | 0.170   |

The variable ‘perceived benefits of treatment’ was also found to be strongly skewed and data transformations did not create normality. Thus, this variable was also excluded from the analyses.

#### 4.12 Variable Formulation

A Principle Component Factor Analysis was used to create one synthetic variable, which constituted ‘food beliefs’ (table 5). According to Aron and Aron (1999) a scale item is considered to contribute meaningfully to a factor if it has a loading of at least 0.30. All the ‘food belief’ items had loadings over 0.40 on the factor. Thus, the factor was saved for inclusion in the statistical analyses (Hair et al., 1995).

Table 5

Principle Factor Analysis for Food Belief Scores (n=147)

| Factor | Eigenvalue | %<br>Variance | Loading Items |   |
|--------|------------|---------------|---------------|---|
| 1      | 2.33       | 38.89         | -0.61         | I like food and dislike restrictions on what I can eat                          |
|        |            |               | -0.65         | I often eat foods because of how they taste, even when they are not good for me |
|        |            |               | -0.61         | I often overeat because the food tastes so good                                 |
|        |            |               | 0.68          | I consider the ingredients of the foods I choose to eat                         |
|        |            |               | 0.41          | Eating healthy foods is more important than the taste of the food               |
|        |            |               | 0.73          | I choose the food I eat because it is good for my body                          |

**4.13 Interpreting Scores**

The following is a guide to interpreting variables contained in this thesis.

- A higher dietary adherence score indicates that the participant reported greater adherence to the recommended diabetes diet.
- A higher 'food belief' score is indicative of a stronger belief that food and eating are about promoting health, and less about obtaining good taste or enjoyment. A lower 'food belief' score represents a weaker belief that food and eating are about promoting health, and more about obtaining good taste or enjoyment.
- A higher score on the variable called 'perceived barriers to treatment' indicates more perceived personal and social obstacles or costs to carrying out diabetes treatment.
- A more 'positive attitude towards medical doctors' is indicated by higher scores. Greater 'negative attitudes toward medical doctors' is indicated by increasing scores.
- Higher scores on internal, powerful-others, and chance 'health locus of control' correspond to greater 'health locus of control' beliefs.

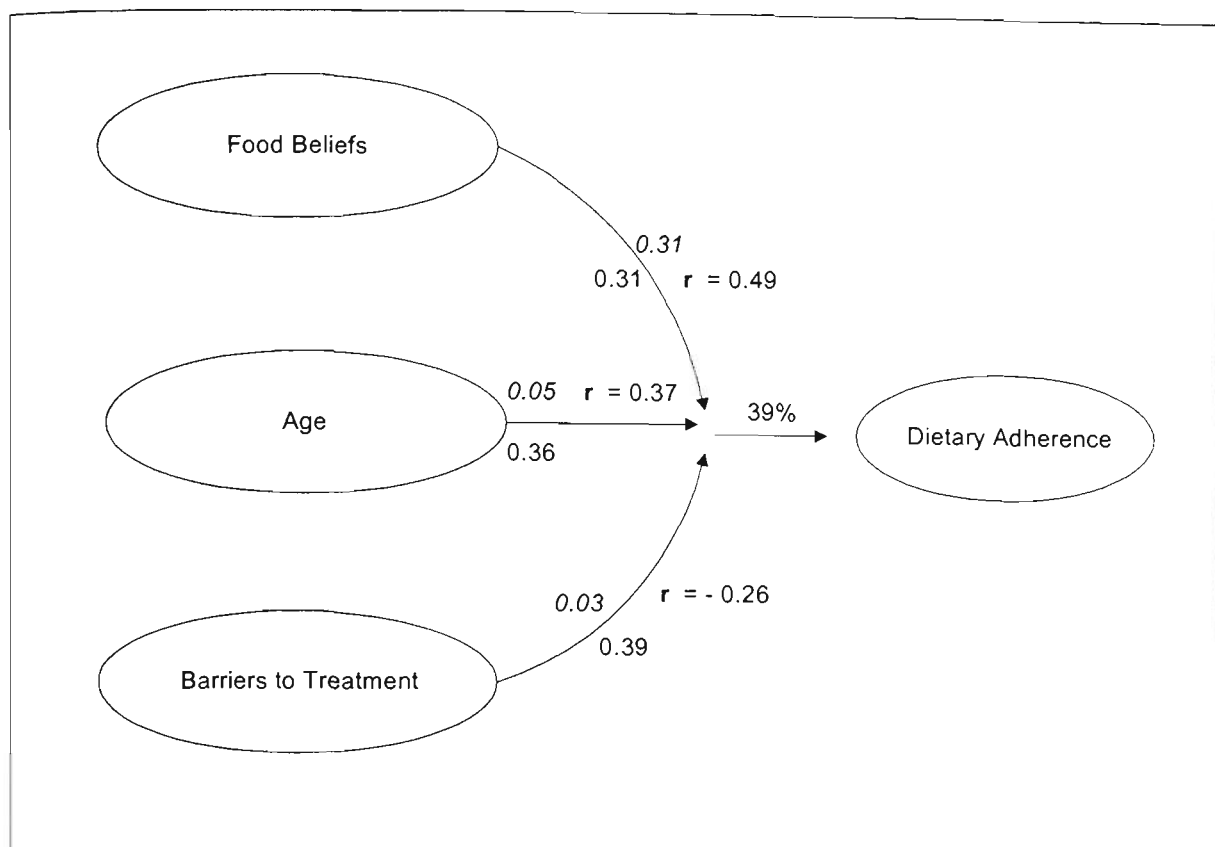
## 4.2 Hypothesised Results

### 4.21 Hypothesis 1: Dietary Adherence, Beliefs about Healthcare, and Beliefs about Treatment

It was hypothesised that patient ‘beliefs about treatment’ and ‘beliefs about healthcare’ would be significant predictors of treatment adherence. It was found that dietary adherence was predicted by ‘food beliefs’, ‘perceived barriers to treatment’, and age. Age and ‘food beliefs’ were positively related to dietary adherence. ‘Perceived barriers to treatment’ was negatively associated with dietary adherence. The first hypothesis was thus partially supported. An additional result was that a person’s ‘food beliefs’ predicted that person’s number of diabetes complications. Participants with stronger ‘food beliefs’ had fewer complications.

All explained variance percentages represent the R squared statistic, not adjusted R squared. The use of R squared is influenced by the number of predictor variables relative to the size of the sample. Generally R squared can be used when there are 10 to 15 observations per predictor (Hair et al., 1995). In this thesis the sample size represented at least 10 times the number of predictors included in the multiple regression analyses.

These results were obtained using a multiple regression analysis with dietary adherence as the dependent variable, and the predictor variables were ‘food beliefs’, ‘perceived barriers to treatment’, ‘powerful-others health locus of control’, ‘chance health locus of control’, ‘internal health locus of control’, ‘positive attitudes towards doctors’, number of complications, and age. Results showed ‘food beliefs’, age, and ‘perceived barriers to treatment’ predicted 39% (R squared 0.39) of the variation in dietary adherence,  $F(3, 79)=16.92$ ,  $p < .05$ . Refer to figure 4. An additional multiple regression analysis found that ‘food beliefs’ predicted a significant, but small, variance in diabetes complications. Food beliefs predicted 5% of variation in the number of complications,  $F(1, 135)=6.41$ ,  $p < .05$ . The zero order correlation co-efficient for ‘food beliefs’ and number of complications was - 0.21.



**Figure 4.** Predicting Dietary Adherence Scores from Beliefs about Treatment Scores and Age (N = 82)

\*Numbers in italics indicate R squared for the individual variable and numbers below the line indicate cumulative R squared when the variable is included in the model. The total variance accounted for by the model is expressed as a percentage.

\*r indicates the zero order correlations for the relationship between each predictor and dietary adherence.



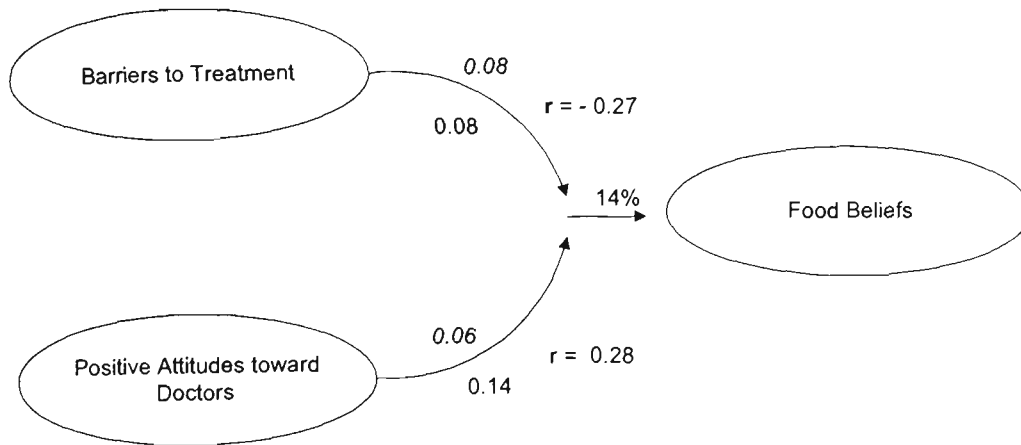
#### 4.22 Hypothesis Two: Beliefs about Healthcare and Beliefs about Treatment

It was hypothesised that there would be predictive relationships between patient 'beliefs about healthcare' and 'beliefs about treatment'. The results showed that 'food beliefs' were predicted by 'perceived barriers to treatment' and a 'positive attitude toward doctors'. 'Food belief' scores increased with a 'positive attitude toward doctors' and decreased with 'perceived barriers to treatment'.

'Perceived barriers to treatment' was predicted by a 'negative attitude toward doctors', 'food beliefs', and 'internal health locus of control'. Both 'food beliefs' and a 'positive attitude towards doctors' negatively related to 'perceived barriers to treatment'. A positive association was found between 'perceived barriers to treatment' and 'negative attitudes to doctors'. The second hypothesis was thus supported. Two multiple regression analyses were conducted to obtain these results.

In the first multiple regression 'food beliefs' was the dependent variable, and the predictor variables were 'perceived barriers to treatment', 'powerful-others health locus of control', 'internal health locus of control', 'positive attitudes to doctors', and 'negative attitudes to doctors'. The findings demonstrated that 'perceived barriers to treatment' and 'positive attitudes towards doctors' predicted 14% of the variation in 'food beliefs',  $F(2, 88)=7.24, p < .05$  (see figure 5).

In a second multiple regression 'perceived barriers to treatment' was the dependent variable, and the predictors were 'food beliefs', 'powerful-others health locus of control', 'chance health locus of control', 'internal health locus of control', 'positive attitudes to doctors', and 'negative attitudes to doctors'. Results showed that a 'negative attitude toward doctors', 'food beliefs', and 'internal health locus of control' predicted 16% of the variation in 'perceived barriers to treatment',  $F(3, 87)=8.28, p < .05$  (figure 6).

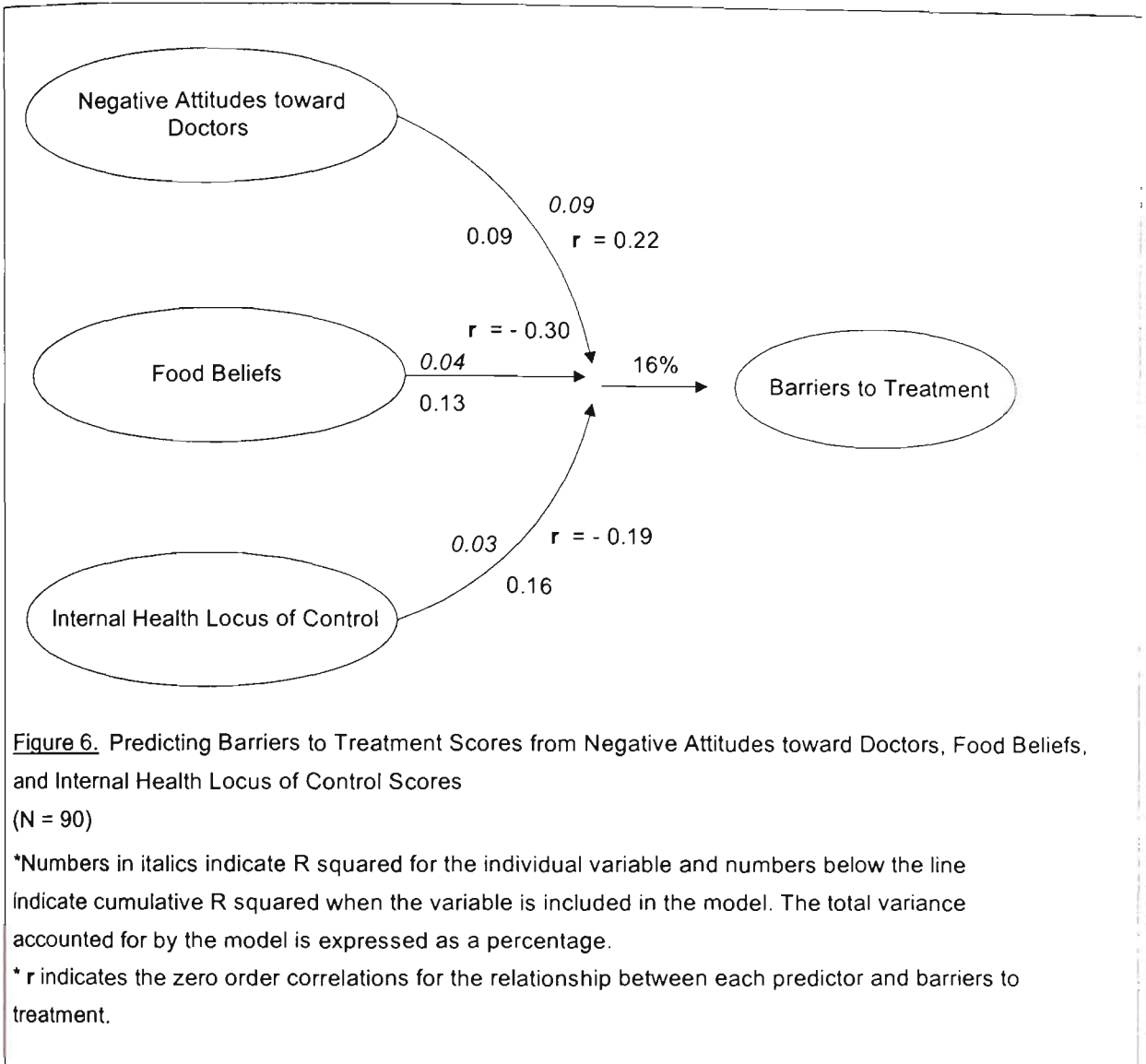


**Figure 5.** Predicting Food Belief Scores from Barriers to Treatment and Positive Attitudes toward Doctor Scores

(N = 90)

\*Numbers in italics indicate R squared for the individual variable and numbers below the line indicate cumulative R squared when the variable is included in the model. The total variance accounted for by the model is expressed as a percentage.

\*  $r$  indicates the zero order correlations for the relationship between each predictor and dietary adherence.



### 4.23 Hypothesis Three: Ethnic Differences in Dietary Adherence and Health Beliefs

The third hypothesis stated that Maltese and Anglo-Saxon patients with diabetes would differ in regards to their health beliefs and treatment adherence (descriptive statistics for both ethnic groups are included in appendix 14). There were no significant differences on dietary adherence or on 'beliefs about treatment'. However, there were ethnic differences found in 'beliefs about healthcare'. The study results showed that Maltese patients believed more strongly that powerful-others are in control of their health relative to Anglo-Saxon patients. Furthermore, a greater number of Maltese people had 'positive attitudes toward doctors' and a greater number of Maltese people also had 'negative attitudes toward doctors'. Among Anglo-Saxon people, 'attitudes toward doctors' showed less variance, with a tight grouping around the mean. These results provide partial support for the third hypothesis.

An additional finding, which helps link the ethnic differences found with the results of the regression analyses, was that 'powerful-others health locus of control beliefs' predicted 'positive attitudes toward doctors'. Maltese participants had stronger 'powerful-others health locus of control' and were also more likely to have 'positive attitudes toward doctors'.

A univariate analysis of variance revealed no ethnic differences in dietary adherence,  $F(1, 115)=0.78, p > .05$ . Maltese participants scored similar to Anglo-Saxon participants on dietary adherence. For illustration purposes, a mean of seven and a standard deviation of one have been employed for all scales in the following t-tests.

Two multivariate analyses of variance were carried out to determine whether there were ethnic differences in health beliefs. The first multivariate analysis of variance showed no differences between Maltese and Anglo-Saxon patients on 'food beliefs' and 'perceived barriers to treatment'. No significant differences were found in the multivariate analysis, where 'food beliefs' and 'perceived barriers to treatment' were considered together,  $F(2, 120)=1.04, p > .05$ . There were also no significant univariate differences for 'food beliefs',  $F(1, 121)=0.48, p > .05$  or for 'perceived barriers to treatment',  $F(1, 121)=0.32, p > .05$ .

The second multivariate analysis of variance showed ethnic differences on 'powerful-others health locus of control', 'positive attitudes toward doctors', and

'negative attitudes toward doctors'. Significant differences were found in the multivariate analysis, where 'powerful-others health locus of control', 'internal health locus of control', 'chance health locus of control', 'positive attitudes toward doctors', and 'negative attitudes toward doctors' were considered together,  $F(2, 100)=2.85, p < .05$ . Univariate analysis showed that there was a difference in 'powerful-others health locus of control',  $F(1, 101)=6.64, p < .05$ . Maltese participants ( $M=7.25, S.D.=1.67$ ) scored higher than Anglo-Saxon participants ( $M=6.72, S.D.=1.18$ ) on 'powerful-others health locus of control'. Univariate analysis also demonstrated a difference in 'positive attitudes toward doctors',  $F(1, 101)=8.39, p < .05$ . Maltese participants ( $M=7.33, S.D.=1.62$ ) had higher scores than Anglo-Saxon participants ( $M=6.76, S.D.=1.14$ ) on 'positive attitudes toward doctors'. There was also a univariate difference in 'negative attitudes toward doctors',  $F(1, 101)=4.30, p < .05$ , with Maltese participants ( $M=7.21, S.D.=1.65$ ) scoring higher than Anglo-Saxon participants ( $M=6.80, S.D.=1.16$ ). No significant univariate differences were found for 'internal health locus of control',  $F(1, 101)=3.19, p > .05$  or for 'chance health locus of control',  $F(1, 101)=1.73, p > .05$ .

An additional multiple regression analysis found that 'powerful-others health locus of control' predicted 34% of variation in 'positive attitudes toward doctors',  $F(1, 1122)=61.44, p < .05$ . The zero order correlation coefficient for 'powerful-others health locus of control' and 'positive attitudes toward doctors' was 0.58.

## 5 Discussion

This chapter interprets the results of the study. It puts forward responses to the research questions and revisits relevant empirical literature in light of the findings. Consideration is given to the study's contribution to scholastic knowledge (sections 5.1, 5.2, 5.3, and 5.4), the methodological limitations (section 5.5), implications of the findings for diabetes services (section 5.6), areas for further research (section 5.7), and general conclusions of this thesis (section 5.8).

### 5.1 Overview

A person with diabetes may prevent disabling and potentially fatal complications by adhering to an effective self-management plan (Flemmer & Vinik, 2000; Leslie & Pozzilli, 2002; Nasr et al., 1999; Stratton et al., 2000). It follows that medical research aimed to develop the most effective diabetes treatment needs to be coupled with psychosocial research, aimed to determine the optimal methods of patient education about self-care.

This study builds on the growing body of literature exploring psychosocial aspects of diabetes. Addresses the following gaps in empirical knowledge.

- Few previous studies have tested a model of diabetes treatment adherence. A new framework emerged from the study results, the 'Diabetes Dietary Adherence Model', for understanding adherence to dietary treatment among people with Type II Diabetes.
- A number of studies have examined the utility of the health belief model for explaining diabetes adherence (Bond et al., 1992; Brownlee Duffeck et al., 1987; Connell et al., 1990; Palardy et al., 1998; Samuel Hodge, 2000; Sensky et al., 1996; Skinner et al., 2000; Wdowik, 1998). This study tested an expanded health belief model that included 'health locus of control', 'food beliefs', and 'attitudes toward doctors'. The study results suggest the utility of an alternative framework to the health belief model, based on 'food beliefs', age, 'attitudes to doctors', 'perceived barriers to treatment', and 'internal health locus of control'.
- Most prior research into the determinants of diabetes treatment adherence has focused on how health beliefs relate to adherence

(Hampson et al., 1990; Nowacek et al., 1990; Palardy et al., 1998). This study further focused on the links between different health beliefs, leading to a greater understanding of what promotes treatment adherence.

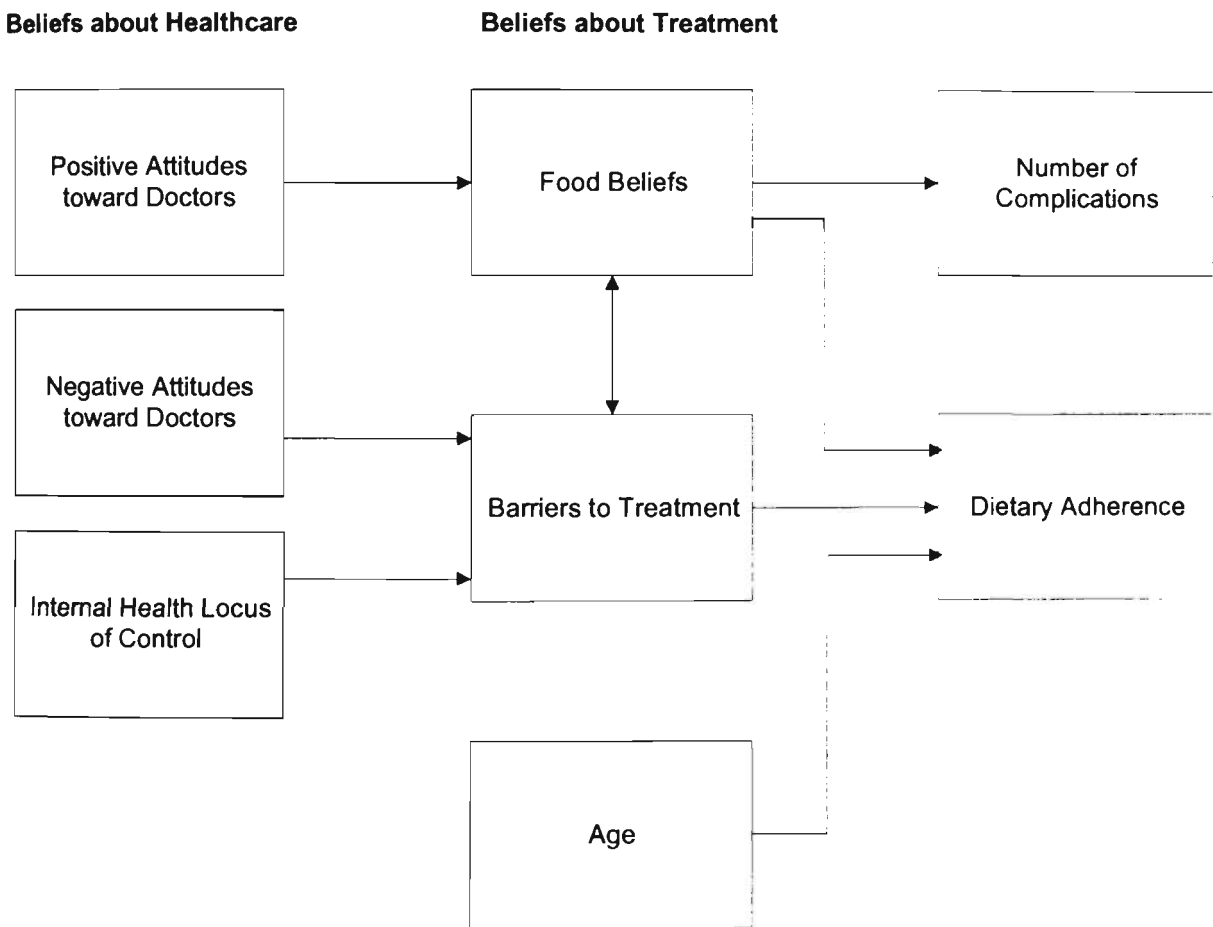
- There is a scarcity of psychosocial research conducted with Maltese people who have diabetes. This study found differences on health beliefs between Maltese Australians and Anglo-Saxon Australians with diabetes.
- Age was an additional variable included in the analyses, which unexpectedly predicted treatment adherence. Prior investigations into how age relates to adherence have largely been conducted with Type I Diabetes patients in adolescence and childhood (Grey, Cameron, & Thurber, 1991; Johnson, Perwien, & Silverstein, 2000; Zangerle & Rathner, 1997). This study demonstrates that among adults with Type II Diabetes, younger age is associated with poorer adherence to dietary treatment.

In this study, the variables ‘medication adherence’ and ‘adherence to home blood glucose monitoring’ showed skewed distributions, therefore, both were excluded from the analyses. The data for adherence to dietary treatment was also skewed, however it was corrected using data transformation techniques (see section 4.11). Thus, adherence to dietary treatment was retained, dietary adherence being particularly low among people with diabetes.

As pictured in figure 7, the ‘Diabetes Dietary Adherence Model’ that emerged from the study findings consists of two sets of health beliefs. The first set of ‘beliefs about treatment’ is comprised of two components: one is a belief taken from the health belief model, ‘perceived barriers to carrying out diabetes treatment’, and the other is ‘beliefs about food’. Stronger ‘food beliefs’ indicate a person believes food and eating are about promoting health. Weaker ‘food beliefs’ indicate a person believes food and eating are about obtaining good taste or enjoyment. Refer to section 3.2 in the method section for a detailed description of the questions used to indicate ‘food beliefs’.

The second set of ‘beliefs about healthcare’ consists of two components: ‘health locus of control’ and ‘attitude toward medical doctors’. The instrument used to measure ‘health locus of control’ consisted of three subscales, ‘internal health locus control’,

'powerful-others health locus of control', and 'chance health locus of control'. Patient 'attitude toward doctors' was measured using two sub-scales, one was indicative of 'negative attitudes toward doctors' and the other indicated 'positive attitudes toward doctors.' The findings also incorporate the influence of age, number of diabetes complications, and ethnicity (Maltese or Anglo-Saxon cultural background). All variables were measured using self-reports, including the extent that patients adhered to dietary treatment.



**Figure 7:** Summary of findings: The Diabetes Dietary Adherence Model



### 5.11 Addressing the Hypotheses

This study put forward three hypotheses that, for the most part, were supported by the findings. The first hypothesis was partially supported by the results of this study. It stated that patient ‘beliefs about treatment’ and ‘beliefs about healthcare’ would predict adherence to diabetes treatment. It was found that ‘beliefs about healthcare’ predicted ‘beliefs about treatment’, while ‘beliefs about treatment’ predicted dietary treatment adherence. Dietary adherence was predicted by stronger ‘food beliefs’, less ‘perceived barriers to treatment’, and older age. In addition, people with stronger ‘food beliefs’ had fewer complications.

The second hypothesis, which stated that there would be predictive relationships between patient ‘beliefs about healthcare’ and ‘beliefs about treatment’, was supported. Stronger ‘food beliefs’ was predicted by fewer ‘perceived barriers to treatment’ and a ‘positive attitude toward doctors’. ‘Perceived barriers to treatment’ were predicted by a ‘negative attitude toward doctors’, weaker ‘food beliefs’, and less ‘internal health locus of control beliefs’.

The results provide partial support for the third hypothesis, which stated that there would be differences on health beliefs and diabetes treatment adherence between Maltese and Anglo-Saxon people. Maltese participants held more ‘powerful-others health locus of control beliefs’ than Anglo-Saxon participants. Moreover, Maltese people with diabetes held more ‘negative attitudes towards doctors’ and more ‘positive attitudes toward doctors’, whereas Anglo-Saxon participants showed less variance in their attitudes toward doctors. In addition, it was found that ‘positive attitudes toward doctors’ was predicted by ‘powerful-others health locus of control’. The study results showed no significant differences on dietary treatment adherence between Maltese and Anglo-Saxon people.

### 5.12 The ‘Diabetes Dietary Adherence Model’ that Emerged from the Study Results

The ‘Diabetes Dietary Adherence Model’ generated by this study may help to identify patient beliefs and attitudes leading to non-adherence with treatment that could

be engaged in patient education and counseling. This section interprets the new model illustrated in figure 7.

According to the new 'Diabetes Dietary Adherence Model', participants who adhered to dietary treatment held stronger 'food beliefs', were older, and perceived less 'barriers to treatment'. First, these findings suggest that awareness regarding the benefits of healthy eating (e.g., good diabetes control, weight loss, and prevention of other chronic illnesses) can promote dietary adherence. Second, it may be suggested that dietary recommendations, dissimilar to food preferences or enjoyable eating practices, may lead to non-adherence with dietary treatment. Third, the results suggest that younger people with Type II Diabetes experience more difficulties with adhering to their dietary regimen. Finally, this study revealed that people with stronger 'food beliefs' had fewer diabetes complications. However, there was no significant relationship found between dietary adherence and complications, which may suggest the link between 'food beliefs' with complications is mediated by other variables, such as medication adherence or level of physical activity. The role of dietary treatment in reducing the occurrence of diabetes complications is well documented in empirical research (Aronne, 2001; Schmidt et al., 1994).

The new 'Diabetes Dietary Adherence Model' indicates that those participants who perceived more 'barriers to treatment' and had more 'positive attitudes toward doctors' were also more likely to hold stronger 'food beliefs' and, therefore, adhered to dietary treatment. These findings suggest that people with diabetes who feel positive about doctors and perceive fewer 'barriers to carrying out treatment' adhere to dietary treatment, possibly because they believe food and eating promote health more than enjoyment. Maybe they are more aware of the benefits of healthy eating, because they seek professional dietary advice more frequently and are more willing to accept or agree with healthy eating information offered by doctors.

A related finding was that participants with more 'negative attitudes toward doctors', less 'internal health locus of control beliefs', and weaker 'food beliefs' were more likely to perceive 'barriers to treatment' and, therefore, showed lower levels of dietary adherence. These findings suggest that diabetes patients who feel negatively about doctors and have less 'internal health locus of control beliefs' do not adhere to dietary treatment, possibly because they encounter more 'barriers to carrying out

treatment'. They may be unable to effectively tackle difficulties with their treatment regimen, perhaps because they do not have suitable professional support or they may not be able or willing to take control of diabetes management.

The findings of this study demonstrated that, relative to Anglo-Saxon Australian people with diabetes, Maltese Australians had more 'powerful-others health locus of control beliefs', stronger 'positive attitudes toward doctors', and stronger 'negative attitudes toward doctors'. Additionally, 'powerful-others health locus of control', higher among Maltese participants, was found predictive of 'positive attitudes toward doctors'. These findings suggest that Maltese people may rely more on professionals for support in health matters and, therefore, they feel more strongly about the usefulness of professional consultation. There was no significant difference found for dietary adherence between Maltese and Anglo-Saxon participants; however the observed ethnic differences on health belief measures suggest that, considering Maltese patients had more 'negative attitudes toward doctors', if the sample had been larger, ethnic differences in dietary adherence might have been more evident. In section 5.2 each aspect of the new 'Diabetes Dietary Adherence Model' (figure 7) will be discussed in the context of the previous empirical research.

## 5.2 *Hypothesis One: The Relationship between Health Beliefs and Diabetes Treatment Adherence*

A primary purpose of this study was to examine the links between health beliefs and diabetes treatment adherence. Previous research has established that patient beliefs and attitudes are significant correlates to treatment adherence (Bradley, 1995; Brownlee Duffeck et al., 1987; De Weerd et al., 1990; Natarajan, Clyburn, & Brown, 2002; Samuel Hodge, 2000; Skinner et al., 2000). Furthermore, promoting change in beliefs and attitudes has been a key focus in successful psychotherapy with people who have diabetes (Clark & Hampson, 2001; Halford et al., 1997; Pichert et al., 1994; Stott et al., 1995). The first hypothesis was partially supported, stating that 'beliefs about treatment and healthcare' would predict adherence to diabetes treatment. The new 'Diabetes Dietary Adherence Model' (figure 7) that emerged from this study shows that 'patient beliefs about the treatment of diabetes' ('food beliefs' and 'perceived barriers to treatment') and patient age predicted 39 percent of the variance in dietary treatment

adherence. The remaining sections of 5.2 discuss these findings in respect to prior research.

### **5.21 Perceived Barriers to Treatment and Diabetes Dietary Adherence**

Empirical knowledge about the psychosocial challenges facing diabetes patients is increasing (Bradley, 1994; Glasgow, 1997; Shillitoe, 1988; Snoek & Skinner, 2000). Relatively few studies, however, have tested a model of diabetes adherence to help integrate empirical knowledge. This study aimed to test an expanded Health Belief Model (HBM) and it resulted in a new 'Diabetes Dietary Adherence Model' (figure 7). The findings did not support the HBM, as a whole, however it did provide the opportunity to explore connections between 'perceived barriers to treatment' with 'food beliefs' (discussed in section 5.31), 'negative attitudes toward doctors' (section 5.33), and 'internal health locus of control' (section 5.34). This section re-visits research pertaining to the HBM. A focal point of the following discussion is the predictive relationship apparent in the new model (figure 7) between 'perceived barriers to treatment' and adherence to dietary treatment.

According to the HBM, patients are more likely to adhere to diabetes treatment if they believe that by doing so they can effectively manage diabetes and reduce their susceptibility to developing complications (Rosenstock, 1960, 1966, 1974). The model consists of two components. The first component is the perceived health threat, which is the 'perceived susceptibility to and severity of diabetes and its complications'. The second component is the perceived effectiveness of treatment regimen, which refers to 'perceived barriers to carrying out treatment' and the 'perceived benefits of carrying out treatment' (see section 2.431 for more detailed definitions) (Allen, 1998).

Three of the four beliefs in the HBM produced skewed data and thus were excluded from the analyses (refer to section 4.11). First, this may be attributable to the instruments used. Investigating 'health locus of control', 'food beliefs', and 'attitudes toward doctors', in addition to the HBM, doubled the length of the questionnaire. Second, the findings may be a function of the clinical sample under investigation. Perhaps people who attend a diabetes clinic are those who believe in the medical approach to their condition (Hampson et al., 1990). In this thesis the distribution of scores for 'perceived severity of diabetes and its complications', 'perceived

susceptibility to diabetes complications', and 'perceived benefits of treatment' were positively skewed. The participants, generally, concurred with current medical views that diabetes can be severe, people with diabetes may be highly susceptible to developing complications, and that diabetes treatment can have great benefits. Similar to the results of this thesis, a number of previous studies with clinical samples, employing the same scales to measure the HBM, produced skewed results, particularly for 'perceived benefits to treatment' and 'perceived severity of diabetes and its complications' (Jennings et al., 1991; Lewis et al., 1990). These findings suggest that there is room for improvement in the measurement of the HBM for use with diabetes patients. 'Perceived barriers to treatment' was the only belief from the HBM examined in this study.

This study found 'perceived barriers to treatment' predicted poorer adherence to dietary treatment and this was in line with previous studies into dietary behaviour (Kloeben & Batish, 1999; Krummel et al., 2002; Maiman et al., 1977; Schafer et al., 1995). Comparably, diabetes research into the HBM indicates consistent results regarding the negative relationship between 'perceived barriers to treatment' with adherence and health outcomes (Bond et al., 1992; Connell et al., 1990; Palardy et al., 1998; Sensky et al., 1996). It may be suggested that overcoming 'perceived barriers to treatment' is pertinent to adherence to dietary treatment, thus this may be an important focus for effective diabetes patient education.

Past findings are inconsistent regarding the relationship between patient adherence with perceptions of the 'severity and susceptibility to diabetes and its complications' (Bond et al., 1992; Dietrich, 1996; Nagel, 2001; Skinner & Hampson, 1998). Furthermore, past research suggests that the HBM in its entirety is a better predictor of medication adherence than dietary behaviour; while dietary behaviour has been predicted by 'perceived barriers and benefits of healthy eating' (Abraham et al., 1999; Adams & Scott, 2000; Brown & Segal, 1996a, 1996b; Budd et al., 1996; Elliott et al., 2001; Hershey et al., 1980; Hollis et al., 1984; Kelly et al., 1987; Kloeben & Batish, 1999; Krummel et al., 2002; Lin et al., 1995; O'Connell et al., 1985; Soliday & Hoeksel, 2000). Considering beliefs about the health threat and adherence to medication regimens were not examined in this study, two questions await further investigation;

- 1) Is the HBM more relevant to health behaviours requiring largely little commitment of time and energy (e.g., taking medication), and is it less relevant to health behaviour requiring long-term commitment (e.g., adhering to dietary recommendations)?
- 2) Is overcoming obstacles to healthy eating more of a focus in the case of dietary behaviour change, and balancing perceptions of the health threat with treatment effectiveness more a focus in medication adherence?

## 5.22 Food Beliefs and Diabetes Dietary Adherence

Motivated to address the scarcity of research into ‘beliefs about food’ with diabetes patients, this study explored beliefs about healthy eating and the taste or enjoyment of food (refer to section 3.232). According to the new ‘Diabetes Dietary Adherence Model’ (figure 7) generated by this study, ‘food beliefs’ was the predictor that accounted for the most variance in dietary treatment adherence. The following discussion returns to the literature pertaining to ‘beliefs about food’. The results will be compared and contrasted with prior studies. Later, section 5.3 will discuss the relationship of ‘food beliefs’ to ‘perceived treatment barriers’ (section 5.31) and to ‘attitudes toward doctors’ (section 5.32).

There are previous empirical findings, in the health sciences and public health suggesting that ‘beliefs about food’ underlie dietary behaviour (Barr & Chapman, 2002; Berg et al., 2000; Brewer et al., 1999; Brug et al., 1995; Cachelin et al., 1998; Gibson et al., 1998; Grogan et al., 1997; Le Bigot Macaux, 2001; Lindeman & Stark, 1999, 2000; Palmer & Leontos, 1995; Roos et al., 2001). However, these studies focus on particular foodstuffs or nutrients and have been, by and large, carried out with non-clinical populations. Stronger (health-related) ‘food beliefs’ predicted better dietary adherence among people with diabetes. This is parallel with previous studies, showing that people who believe a particular food is healthy consume more of that food (Dusdieker et al., 1985; Ford et al., 1989; Grotkowski & Sims, 1978; Jones, 1987; Kaufmann et al., 1975; Kronl et al., 1982; McConaghy, 1989; Morse et al., 1979; Pomerleau et al., 2001; Tuorila & Pangborn, 1988). It may be proposed, therefore, that participants in this study who believed food and eating are about promoting health were more likely to adhere to dietary treatment, because they were accurately informed about the

advantages of healthy eating. Potential links between ‘food beliefs’, dietary adherence, access to dietary information, and knowledge about diabetes treatment may be considerations for future research.

Further, this study found weaker (taste/enjoyment-related) ‘food beliefs’ predicted poorer dietary adherence. Previous findings suggest that food considered tasty are consumed more frequently. This suggests that participants in this thesis who believed food and eating are about obtaining good taste or enjoyment were less likely to adhere to dietary treatment, perhaps because they had food preferences that differed from diabetes dietary guidelines (Barr & Chapman, 2002; Berg et al., 2000; Brewer et al., 1999; Brug et al., 1995; Cachelin et al., 1998; Contento et al., 1993; Gibson et al., 1998; Grogan et al., 1997; Krondl et al., 1982; Le Bigot Macaux, 2001; Lindeman & Stark, 1999, 2000; Palmer & Leontos, 1995; Richardson et al., 1993; Roos et al., 2001; Rosin et al., 1992; Taylor & Caldwell, 1985; Tuorila & Pangborn, 1988; Tuorila et al., 1990).

Although research into ‘food beliefs’ among diabetes patients have mainly concentrated on eating disorders, prior findings are in agreement with this thesis, in that cognitions regarding food and eating have been found connected with treatment adherence (Crow et al., 2001; Herpertz et al., 1995; Herpertz et al., 1998; Lloyd et al., 1987; Mannucci et al., 2002; Nielsen et al., 1987; Olmstead et al., 2002; Powers et al., 1983; Rosmark et al., 1986; Surgenor et al., 2002). The current results particularly support Maclean (1991), who proposed that poorer adherence occurred when dietary treatment was perceived by the patient to compromise psychosocial well-being. Maclean (1991) found that diabetes patients were more likely to take liberties with their dietary treatment than they were to sacrifice competing psychosocial needs.

The results of this thesis suggest that diabetes dietary guidelines tailored to different tastes may promote dietary adherence, especially among patients who are less adherent to treatment. Addressing issues around the enjoyment or taste of food in patient education programs may be just as important as imparting accurate information about healthy eating.

### **5.221 Food Beliefs and Diabetes Complications**

Empirical studies have demonstrated that effective treatment, including a dietary regimen, can reduce or prevent the development of diabetes complications, such as blindness, limb amputation, and heart disease (Delahanty et al., 1993; Flemmer & Vinik, 2000; Leslie & Pozzilli, 2002; Nasr et al., 1999; Stratton et al., 2000). A focal point of psychosocial research has been how diabetes complications relate to depression and quality of life (Bradley et al., 1999; Karlsen, 2002; Kinder, 2001; Maronian et al., 1999). This thesis provides a rare insight into the connections between ‘food beliefs’ and long-term health outcomes. The results illustrated in figure 7, suggest that addressing ‘beliefs about food’ may assist patients reduce their risk of developing complications. It was found that people with stronger ‘food beliefs’ adhered to dietary treatment and developed fewer diabetes complications. Participants who had weaker ‘food beliefs’ adhered less with dietary treatment and developed more complications. However, given the cross-sectional nature of this study, it is just as feasible for the severity/presence of diabetes complications to have affected a person’s beliefs about food. For example, people who have developed a number of complications may believe that what they eat has no effect on their diabetes. Moreover, in view of the finding that dietary adherence was found unrelated to diabetes complications, linkages between dietary adherence and complications may be mediated by other variables, such as adherence to medication or exercise regimens.

### **5.23 Age and Diabetes Dietary Adherence**

A number of studies provide evidence suggesting people of different ages adjust differently to diabetes (Brown, 1992; Fisher et al., 1997; Grey, Lipman, Cameron, & Thurber, 1997; Weiss, 1999). Research has particularly investigated differences between children and adolescents with Type I Diabetes. Children, especially those who developed diabetes before adolescence, have been found to adjust well to treatment and their diabetes is better managed. Contrastingly, teenagers, especially those who developed Type I Diabetes in adolescence, show relatively poorer adjustment and adhere less to treatment (Hagen, Barclay, Anderson, Feeman, & et al., 1990; Jacobson, Hauser, Lavori, Wolfsdorf, & et al., 1990; Johnson, Freund, Silverstein, Hansen, & et al., 1990; Johnson et al., 2000; Rempala, 1999). It has been suggested that these age differences may not be attributable to disease duration, but rather based upon variation



in developmental level (Band & Weisz, 1990; Zangerle & Rathner, 1997). For example, studies suggest age differences relate to coping strategies, family or parent-child issues, and growth spurts or physical development (Madsen, Roisman, & Collins, 2002; Paterson & Thorne, 2000; Steinberg, 1999; Tietz & Vidmar, 1972).

This study contributes to the gap in research regarding age differences in adjustment to treatment among adults with Type II Diabetes. The new 'Diabetes Dietary Adherence Model' (figure 7) generated by this thesis suggests that older patients adhered to dietary treatment, whereas younger adults showed lower levels of dietary adherence.

This finding is consistent with the few studies that have looked at these variables and were conducted with Type II Diabetes patients. It was found that people of different ages vary in their response to self-management education programs, and also differ in their reliance on lay or folk knowledge in diabetes self-care (Christensen, 1995; Reid, 1992). Further research should investigate the concerns and difficulties relating to dietary treatment experienced by younger people who have Type II Diabetes. Consideration given to past studies with youth who have Type I Diabetes, further studies with Type II patients may examine age variation in treatment adherence in relation to coping strategies, family issues, spousal relationships, and physical ageing processes.

#### **5.24 Beliefs about Healthcare and Diabetes Dietary Adherence**

One aspect of the first hypothesis was not supported by this study: 'beliefs about healthcare' did not predict diabetes treatment adherence. Nevertheless, 'beliefs about healthcare' did predict 'beliefs about treatment', demonstrating a possible indirect link between 'beliefs about healthcare' with adherence to dietary treatment via 'beliefs regarding treatment'.

Relevant here is Azjen's (1996) principle of compatibility. It is the notion that cognitions and behaviour measured at the same level of generality or specificity (e.g., 'beliefs about treatment' and treatment adherence) detect stronger relationships of cognitions to behaviour. However, investigating a wider array of cognitions may reveal indirect links with behaviour, such as 'beliefs about healthcare' to adherence. The new

‘Diabetes Dietary Adherence Model’ (figure 7) serves to illustrate some of the complex decision-making processes that underlie patient participation in diabetes management.

### 5.3 *Hypothesis Two: The Relationship between Beliefs about Healthcare and Beliefs about treatment*

In contrast to a number of earlier diabetes studies (Hampson et al., 1990; Nowacek et al., 1990; Palardy et al., 1998), this study not only aimed to identify some key health beliefs that may underlie treatment adherence, it also aimed to explore the wider network of beliefs that underpin those key beliefs. The results of this study provide support for the second hypothesis. It stated that there would be predictive relationships between patient ‘beliefs about treatment’ and patient ‘beliefs about healthcare’. The new ‘Diabetes Dietary Adherence Model’ (figure 7) produced by this thesis indicates, first, that stronger ‘food beliefs’ were predicted by fewer ‘perceived barriers to treatment’ and a ‘positive attitude toward doctors’. Accounting for 14 percent of the variance in ‘food beliefs’. Second, ‘perceived barriers to treatment’ were predicted by a ‘negative attitude toward doctors’, weaker ‘food beliefs’, and less ‘internal health locus of control beliefs’. Accounting for 22 percent of the variance in ‘perceived barriers to treatment’. These findings will be discussed from the perspective of previous research.

#### 5.31 **Food Beliefs and Perceived Barriers to Treatment**

The link found in this study between ‘food beliefs’ and ‘perceived barriers to treatment’ makes clearer the possible reasons why participants with stronger ‘food beliefs’ were more likely to adhere to dietary treatment. It is proposed that for some people with diabetes a barrier to carrying out dietary treatment may be the taste quality of recommended foods and cooking methods. Findings indicate that this concern was specifically relevant to people who believed food and eating are about obtaining good taste or enjoyment. Participants who believed food and eating are about promoting health experienced fewer ‘barriers to treatment’.

These findings are consistent with past research, in that ‘beliefs about the health benefits of particular foods’ have been found associated with healthy eating. Correspondingly, previous results show that ‘beliefs regarding the taste of food’ can be obstacles to eating healthy (Anderson et al., 1998; Brown et al., 2002; Guldan et al.,

1995; Lea & Worsley, 2002; Lloyd et al., 1995; Peltzer, 2002; Phillips & Briggs, 1975; Smith & Owen, 1992). For instance, Lloyd, Paisley, and Mela (1995) found taste quality was a barrier to reducing fat consumption. Prospective studies may investigate more specifically the difficulties relating to the taste or enjoyment of food and dietary treatment among diabetes patients. Further research may also evaluate the effectiveness of dietary education that addresses patient concerns related to food preferences.

### **5.32 Food Beliefs and Attitudes toward Medical Doctors**

Previous research found that the doctor-patient relationship impacts on patient adherence to treatment, therefore, improving collaboration of practitioners with their clients has become a primary focus of medical training (Alvarez-Gordillo et al., 2000; Britten et al., 2000; Butler et al., 1998; Carmen Luciano & Herruzo, 1992; Castro, 1974; Coleman & Murray, 2002; Gillespie, 2001; Golin et al., 1996; Leopold et al., 1996; Make, 1994; McCann & Blossom, 1990; Noble, 1998; Roberts, 2002; Rost et al., 1989; Squier, 1990; Warner, 1981). This study addressed the lack of empirical knowledge regarding the links between patient 'food beliefs' and patient 'attitudes toward doctors'.

The relationship found in this study between 'food beliefs' and 'positive attitudes toward doctors' helps to explain why patients with stronger 'food beliefs' may adhere to dietary treatment. Participants who believed food and eating promote health were more aware of the benefits of healthy eating, perhaps because they were more positive about doctors, sought professional dietary advice more frequently, and were more willing to accept or agree with healthy eating advice offered by doctors. This viewpoint is supported by the study of Landel (1996), which showed that diabetes patients who had positive relationships with their doctors were more likely to attend medical appointments and adhere to dietary recommendations. Also relevant to this study are past findings suggesting that patients were more likely to follow a treatment plan if their beliefs about the treatment of diabetes were congruent with those of their doctor (Boyer et al., 1996; Freeman & Loewe, 2000). The results of this study suggest that improving doctor-patient relationships may increase the readiness of patients to adopt dietary treatment.

### 5.33 Barriers to Treatment and Attitudes toward Medical Doctors

The 'Diabetes Dietary Adherence Model' (figure 7) generated by this thesis revealed a positive relationship between 'perceived barriers to treatment' and 'negative attitudes toward doctors'. This suggests participants who had stronger 'negative attitudes toward doctors' tended to experience more 'barriers to treatment', perhaps because they did not have the professional support they needed to overcome difficulties with regimen tasks.

These results are in agreement with previous research into screening for breast cancer. For example, prior studies have found 'perceived barriers and benefits of carrying out screening' related to physician recommendation (Austin et al., 2002; Black et al., 2001; Rimer et al., 1991). Moreover, there are diabetes studies suggesting that congruent beliefs between patients and health professionals about the difficulties encountered in treatment may promote adherence (Anderson et al., 1993; Woodcock & Kinmonth, 2001).

Taken together, both the results of this study and prior findings suggest that it may be beneficial for doctors to focus on improving their relationship with patients, so that difficulties with treatment can be communicated in a positive atmosphere. Improving the doctor-patient relationship may be particularly valuable for patients who have strong 'negative attitudes toward doctors', because these patients do not seem to be effectively tackling obstacles to adherence. Perhaps, for some patients alternative support from peers or family may lessen non-adherence. 'Barriers to carrying out diabetes treatment' need further exploration in relation to specific difficulties with the doctor-patient relationship.

### 5.34 Barriers to Treatment and Health Locus of Control

According to Wallston et al., (1978), 'health locus of control' (HLOC) refers to whether a health outcome is perceived as contingent upon one's own behaviour ('internal HLOC'), whether it is perceived as contingent upon the behaviour of family, friends, or health professionals (external, 'powerful-others HLOC'), or whether a health outcome is perceived as dependent upon forces of fate or luck (external, 'chance HLOC'). An ongoing issue in research is how 'internal HLOC' and 'external HLOC'

differ in relation to health behaviour (Steptoe & Wardle, 2001b; Stickland, 1974; Wallston & Wallston, 1978).

It has been suggested that the link between HLOC and health behaviour depends on the population under consideration. For example, 'internal HLOC' has been found relevant to non-clinical populations, particularly in relation to actions aimed at preventing illness; while 'external HLOC', particularly 'powerful-others HLOC', has been found of greater relevance to clinical populations, like people undertaking treatment for chronic illness (Bourjolly, 1999; Chan et al., 2001; Christensen et al., 1997; Gierszewski, 1983; Goldney & Cameron, 1981; Gregory, 1998; Kent et al., 1984; Levenson, 1973; McDonough et al., 1996; Morgan et al., 1995; Norman et al., 1998; Ozasa et al., 1995; Steptoe & Wardle, 2001b; Wallston & Wallston, 1978; Wallston & Wallston, 1981; Wallston et al., 1987; Webb et al., 1988; Wong & White, 2002).

On the other hand, it has also been suggested that the link between HLOC and health behaviour depends on the type of behaviour under consideration. For instance, studies show 'internal HLOC' relates strongly with dietary behaviour (Gettner, 1995; Goldney & Cameron, 1981; Hollis et al., 1984; Keltner, 1984; Kendler et al., 1991; Morrill, 1995; Rotenberg & Flood, 2000; Sparks et al., 1995; Stone & Pangborn, 1990; Stotland & Zuroff, 1990; Williams et al., 1990), and that adherence to medication regimens relates to 'powerful-others HLOC' (Aversa, 1996; Beardsley et al., 1982; Christensen et al., 1997; Lin & Liang, 1997; Raiz et al., 1999; Wang et al., 2002). People with diabetes often need multiple modes of treatment, dietary and medication, therefore both 'internal HLOC' and 'external HLOC' have been found linked to regimen adherence and desirable health outcomes (Rodin, 1983; Schlenk & Hart, 1984).

In this thesis it was found that 'internal HLOC' predicted fewer 'perceived barriers to treatment'. Previous studies are lacking in respect to HLOC and the health belief model, however there has been empirical investigation into a similar construct, self-efficacy. Self-efficacy is a useful comparison, as it has been found related to 'internal HLOC' (Aalto et al., 1997). Parallel with the results of this thesis, Adih and Alexander (1999) found links between low self-efficacy and 'perceived barriers to condom use' with less frequent use of condoms. A study by Glasgow, Toobert, Riddle, Donnelly, and Calder (1989) may also be relevant to the results of this thesis. They

found that diabetes patients had lower self-efficacy in relation to dietary treatment tasks and perceived more ‘barriers to carrying out dietary treatment.’

The relationship found in this thesis between ‘internal health locus of control’ and ‘perceived barriers to treatment’ suggests that diabetes patients may be more able to handle difficulties with treatment if they believe they are in control of their health. Diabetes education programs may, thus, enhance feelings of empowerment among patients by offering personal strategies and resources (skills and knowledge) to deal with practical treatment difficulties related to family, work, and lifestyle choices (Funnell & Anderson, 2002).

#### 5.4 *Hypothesis Three: Ethnic Differences in Health Beliefs and Diabetes Dietary Adherence*

Generally, adherence to treatment is poorer among people of minority ethnic groups, therefore culturally-appropriate services are becoming an integral part of diabetes care, particularly in Western countries (Bertera, 2003; Black, Ray, & Markides, 1999; Colagiuri et al., 1998; De Vera, 2003; Karter, Ferrara, Darbinian, Ackerson, & Selby, 2000; Kieffer et al., 2002; Musey et al., 1995; Western Region Health Centre, 2001). Understanding differences in health beliefs between minority and majority ethnic groups can help design diabetes programs that are aligned with particular cultural beliefs.

Hypothesis three stated that there would be significant differences between Maltese and Anglo-Saxon patients on health beliefs and diabetes treatment adherence. This hypothesis was partially supported. The results of this thesis demonstrated that Maltese and Anglo-Saxon people with Type II Diabetes differed in their ‘beliefs about healthcare’, but no ethnic differences were found for ‘beliefs about treatment’ and dietary adherence. Maltese participants had stronger ‘positive attitudes toward doctors’ and stronger ‘negative attitudes toward doctors’, in contrast to Anglo-Saxon participants who showed less intense ‘attitudes toward doctors’. Furthermore, Maltese participants had more ‘powerful-others health locus of control’ than the Anglo-Saxon participants, ‘powerful-others health locus of control’ being predictive of ‘positive attitudes toward doctors’. The following is a discussion of these findings, which revisits research into ethnicity, ‘health locus of control’, and ‘attitudes toward doctors’, and literature regarding Maltese and Anglo-Saxon culture.

#### **5.41 Ethnicity and Health Locus of Control: Comparing Maltese Australians with Anglo-Saxon Australians**

The number of people of Maltese background in Australia may be exceeded than the population of Malta itself. Particularly large is the Maltese community in the Western Metropolitan Region of Melbourne, from which the participants of this thesis were selected (McDonald, 2000). Diabetes is a central issue in Malta, with prevalence rates reported as high as 18 percent (Bugeja & Azzopardi, 1999; Dimech, 1992; Martin et al., 1984; Schranz, 1989; Schranz, 1995; Schranz & Prikatsky, 1989; Tuomilehto et al., 1988; Tuomilehto et al., 1994; Zammit Maempel, 1965; Zammit Maempel, 1978a). However, little is known about diabetes among Maltese people residing outside of Malta. Moreover, research suggests there is a need for culturally-appropriate diabetes education (Diabetes Australia, 1997), however there is a lack of psychosocial research exploring the ways that health professionals can assist Maltese people effectively adjust to diabetes treatment.

This thesis aimed to understand how Maltese Australian people differ from Anglo-Saxon Australians in respect to health beliefs and diabetes treatment adherence. It was found that Maltese people had stronger ‘powerful-others health locus of control’ (‘powerful-others HLOC’) than the Anglo-Saxon participants, and that ‘powerful-others HLOC’ predicted ‘positive attitudes toward doctors.’

There seems to be a gap in psychological research in respect to ‘locus of control beliefs’ among Maltese people. The findings of Zahra (1998), regarding ‘nutritional locus of control’, are comparable with the results of this study. Zahra (1998) found among factory employees in Malta only 50 percent believed that they could control the type and amount of fat they consumed. Due to the scarcity of empirical research into ‘locus of control’ conducted with Maltese people, the results of this thesis will be interpreted in the context of wider ‘locus of control’ research relating to ethnicity.

##### **5.411 The Study Findings and Locus of Control Research**

A fairly consistent pattern in previous research is that people of collectivist cultural groupings, who are frequently also of ethnic minority groups, tend to have stronger ‘external locus of control’ (‘external LOC’) relative to people of individualistic cultures, by in large persons of majority ethnic groupings in Western countries

(Bachiocco et al., 2002; Bjork & Lee, 1997; Furnham & Nordling, 1998; Gebhardt et al., 2001; Levenson, 1981; Rimoldi et al., 2002; Sastry & Ross, 1998; Stanhope, 2002; Swinney, 2002; Wenzel, 1993). For example, Borrayo and Guarnaccia (2000) found Mexico-born people living in the United States had more 'external health locus of control' ('external HLOC') than United States-born people. Furthermore, Stanhope (2002) found people living in India placed more emphasis upon 'external LOC' compared to people living in the United States. Additionally, Wenzel (1993) found Black American people believed more strongly in 'external LOC' than their White counterparts.

In accordance with empirical literature, two possible explanations can be put forward for the differences found in this thesis between Maltese and Anglo-Saxon Australians on 'health locus of control beliefs' ('HLOC'): One relates to Triandis' (1995) theory of collectivist and individualistic cultures and the second relates to socio-economic status.

According to Triandis (1995), collectivist cultural beliefs and practices differ from individualistic cultures in four respects. First, in collectivist cultures the definition of self is interdependent and in individualistic cultures the self is defined independently. Second, personal goals are more aligned with communal goals in collectivist cultures relative to individualistic cultures. Third, in collectivist cultures norms, obligations, and duties guide social behaviour, whereas in individualistic cultures personal needs, rights, and attitudes are guiding principles. Forth, in collectivist cultures the emphasis is upon relationships, contrastingly, in individualistic cultures the focus is on rational analysis of the personal advantages of maintaining a relationship.

Prior research describes Maltese culture as collectivist. For instance, Proctor's (1998b) findings suggest that a sense of being connected with others is an important need among Maltese people. Briffa (1998) also speaks of the saliency of family and family roles for Maltese Australians. A study conducted by Abela (1991) investigating beliefs among people in Malta and other parts of Western Europe, also illustrates the collective nature of Maltese culture. He found that Maltese people believed more in the importance of good manners, religious faith, and obedience. In contrast, people from other West European countries, such as Britain and Ireland, believed more in the importance of leadership, independence, and self-control. Frenco (1991), however,



refers to Maltese culture as submissive rather than collective. He suggests that the Maltese community in Australia is a low-profile one and attributes this to Malta's long colonial history. For example, Malta remained a British colony until its independence in the 1960s, which occurred after the wave of Maltese immigration to Australia (Frendo, 1991).

One possible explanation for Maltese participants in this thesis having stronger 'power-others health locus of control' ('powerful others HLOC') may be the collective nature of Maltese culture. This is supported by Sastry and Ross (1998), who proposed that people within individualistic cultures (e.g., Anglo-Saxon Australian culture) may experience success when they pursue or exercise individual control over reality. In contrast, persons in collective cultures (e.g., Maltese Australian culture) who seek or exercise individual control may be negatively sanctioned for placing self-interests before group needs, thus developing a stronger belief in 'external LOC'.

An alternative explanation for the ethnic differences found in HLOC refers to the connection between minority ethnic groups and lower socio-economic status. Research suggests that people of lower socio-economic groups tend to have greater 'external LOC' than people of higher socio-economic groups, because they generally experience less individual control within the social arena (Hakeem et al., 2001; Spalding, 1995). For example, Galanos (1994) found the belief in the 'external LOC' was predicted by ethnicity, education level, and socio-economic status. Although data regarding occupational status and household income was not collated in this thesis, the information indicating education level (see table 1, in section 3) shows that Maltese participants were considerably less educated than the Anglo-Saxon people who participated in this study. This difference in educational level may account for the difference in HLOC. This thesis did not control for educational level in order to maintain acceptable sample sizes. Moreover, there is empirical evidence suggesting that ethnic variations found in LOC between minority and majority ethnic groups may be separate from the influence of socio-economic factors (Bremer et al., 1997; Eden et al., 1984; Wrightson & Wardle, 1997).

In this thesis Maltese participants did not differ from Anglo-Saxon participants on 'internal health locus of control' ('internal HLOC'). It may be suggested, therefore, that stronger external 'powerful-others HLOC' does not necessitate weaker 'internal

HLOC'. In collectivist cultures 'external HLOC' may add to a sense of 'internal HLOC'. For instance, in one study it was found among Chinese participants the strongest relationship to 'internal LOC' was with 'family control', a measure of family as the agency of control. The next strongest relationship was found between 'internal LOC' and 'other control', indicating other people as the agency of control. On the contrary, among American participants the only significant association found was between 'internal LOC' and self as the agency of control (Chia, Cheng, & Chuang, 1998). Future research, comparing Maltese and Anglo-Saxon Australians may endeavour to disentangle the influence of collectivist culture, individualistic culture, and socio-economic status upon LOC.

In the light of this thesis, culturally-appropriate diabetes education for Maltese people may involve significant others, such as family and friends, in addition to health professionals. A recent project, carried out by the Western Metropolitan Migrant Resource Centre in Melbourne, also recommended group diabetes education programs targeting Maltese people to facilitate peer and family support (Cassar & Schembri, 2002; Karantzas, 2003).

#### **5.412 The Study Findings and Health Locus of Control Research**

Relative to LOC research, the connection between 'external HLOC' with collective cultures is less clear (Buchwald et al., 1996; Zeltzer & LeBaron, 1985). For example, Weitzel (1994) found Hispanic and Black persons differed on 'powerful-others HLOC' and consequently questioned the common practice of assuming minority groups share similar LOC beliefs. Moreover, Sun and Stewart (2000) found increasing 'internal HLOC' associated with 'positive affect' in Hong Kong Chinese people with cancer.

The mixed results in respect to ethnicity and HLOC may reflect the variation in socio-historical experiences of illness and medicine across cultural groups. Much research findings in relation to HLOC have been interpreted in socio-cultural context, however without explicit measurement of (culturally relevant) beliefs other than HLOC (Black et al., 1998; Healy, 1997; Holroyd et al., 2001; Stein et al., 1984; Wilson et al., 1994).

Similar to Wrightson and Wardle (1997) the results of this thesis regarding 'powerful-others HLOC' among Maltese participants will be discussed in the context of their 'attitudes toward doctors' in the next section. Wrightson and Wardle (1997) conducted a study with Caucasian, South Asian, and Afro-Caribbean women and it was demonstrated that South Asian women scored higher on 'chance HLOC', 'powerful-others HLOC', 'internal HLOC', and religiousness. They interpreted the findings regarding HLOC in the context of religious beliefs, suggesting that people of South Asian background may have believed that god influenced health through life circumstances ('chance HLOC'), self ('internal HLOC'), and other people ('powerful-others HLOC').

#### **5.42 Ethnicity and Attitudes toward Medical Doctors: Comparing Maltese Australians with Anglo-Saxon Australians**

In agreement with previous research, this thesis found cultural background linked to 'patient attitudes toward medical doctors' (Andresen, 2001; Griffiths et al., 2001; Meredith & Siu, 1995; van Ryn & Burke, 2000). Maltese Australian people with diabetes had stronger 'positive attitudes to doctors' and stronger 'negative attitudes toward doctors'; while the Anglo-Saxon participants showed less variation in their 'attitudes toward doctors'. It may be suggested that Maltese people had stronger 'attitudes toward doctors' because they believed consulting with doctors is important to their health ('powerful-others HLOC'). Contrastingly, Anglo-Saxon participants believed consulting with doctors is of less importance to matters of health and, thus, they had less intense 'attitudes toward doctors'. The results of this thesis are compared to empirical findings regarding Maltese health beliefs.

Supporting the results of this thesis, a project carried out by the Western Metropolitan Migrant Resource Centre, Melbourne, indicated that Maltese people mainly saw general practitioners about their diabetes and that they expressed great dissatisfaction regarding the information given to them by their doctor (Cassar & Schembri, 2002; Karantzas, 2003). Similarly, Azzopardi (2000) investigated a parent self-advocacy group in Malta. He found that parents of children with a disability who participated in the advocacy group believed many of their relationships with professionals were negative, even though they desired positive relationships.

The current study indicated that ‘powerful-others HLOC’ predicted ‘positive attitudes toward doctors’, which in turn was found linked to stronger ‘food beliefs’ and dietary adherence. Both ‘powerful-others health locus of control’ and ‘positive attitudes toward doctors’ were higher among Maltese participants relative to Anglo-Saxon participants. These findings are in parallel with previous studies, suggesting that ‘powerful-others health locus of control’ promotes adherence to treatment among diabetes patients (Schlenk & Hart, 1984). Diabetes education may aim to build on the apparent strong relationships of some Maltese clients with their doctors. This thesis also found ‘negative attitudes toward doctors’ may lead to greater ‘perceived barriers to treatment’ and poorer dietary adherence, ‘negative attitudes toward doctors’ being higher among Maltese participants. Future research, therefore, may explore the issues that underlie ‘negative attitudes toward doctors’ among Maltese people with diabetes, for example do Maltese people expect their doctor to be more authoritative or do they prefer a more collaborative patient-doctor relationship? Moreover, there was no significant difference found for dietary adherence between Maltese and Anglo-Saxon participants, however, considering Maltese patients had more ‘negative attitudes toward doctors’, it may be suggested that, if the sample had been larger, ethnic differences in dietary adherence might have been more evident.

### 5.5 *Limitations of the Study Design*

This section will discuss twelve main limitations to the study design. It will outline the measures taken to minimise the possible effect of each extraneous variable.

1) The new ‘Dietary Diabetes Adherence Model’ proposed in this thesis is tentative. The framework, as a whole, was not based upon statistical modelling techniques. The sample size limited the statistics that could be applied.

2) The current thesis incorporated a number of scales to test the hypotheses. Authors disagree on the role of adjustments to alpha when large multifaceted research requires the testing of a number of distinct dependent variables (Saville, 1990). Adjustments to alpha on a global basis would discourage large studies that attempt to gain a triangular understanding of vital issues. The author has, therefore, accepted the primus of theorists such as Saville (1990), who discourage global alpha adjustments at the expense of presenting important findings in multifaceted studies. Indeed, as with all

research, it is recommended that results presented here pass the test of replication through further confirmatory study.

3) There is a possibility that the correlational relationships identified in this study resulted from the action of an unobserved third variable. To potentially address this limitation age and number of diabetes complications were included in the multiple regression analyses, to account for the influence of variables other than the beliefs and attitudes included in the hypotheses.

4) A further limitation of correlational research is the inability to draw causal conclusions from the data generated, for example this work cannot determine if cognitions lead to behaviour or whether the relationship is bi-directional. Correlational research, however, can be used to explore potential causal relationships without tight control over variables that may restrict the generality of conclusions. The first step in determining a causal relationship is determining if a relationship is evident. Further experimental research may indicate if the relationships are causal.

5) A fifth limitation questions the reliability of self-reports as a means of data collection. However, it is believed that the emphasis upon honest and confidential questionnaire responses by the researcher minimised this threat. Following is a more detailed discussion regarding self-reporting diabetes treatment adherence.

Physiological measures of glycemic control (e.g., HbA1c) have been employed to indicate diabetes treatment behaviour in many previous studies, because of an assumption that adherence to recommended diabetes regimens will produce better glycemic control. However, according to Myers and Midence (1998) several studies demonstrate a weak relationship between glycemic control and treatment behaviour.

This is not to say that good glycemic control is not important, however, just as a low relationship exists between study time and grades due to confounding factors such as intelligence and the quality of time spent studying, many studies demonstrate a low relationship between treatment behaviour and glycemic control due to confounding factors such as difference in physiology and diabetes education. Measuring grades may not be as useful to improving grades as measuring what the student actually does during study. Likewise, measuring specific diabetes treatment behaviours may be more relevant to improving health status than physiological measures of glycemic control.

Some of the extraneous variables that confound glycemic control from being a reliable measure of treatment adherence include severity of illness, inappropriateness of the prescribed regimen, lack of patient education, and patient disagreement with the prescribed treatment (Glasgow, McCaul, & Schafer, 1987; Myers & Midence, 1998).

In this thesis, self-reports of adherence to specific regimen tasks provided an opportunity to investigate dietary adherence in more detail. Further study may incorporate physiological measures of blood glucose control into the new model.

**6)** Practical considerations prevented the use of random methods of selection. The technique used to acquire the sample was non-random, in that all persons who were interested in participating in the study and who met the selection criteria were given a questionnaire, and all those who mailed the completed questionnaire were included in the analyses. However, consideration given to the Australian National 1996 census data, characteristics of the study sample seem reflective of population demographics in terms of age and education level. For instance, the 1996 census data showed a median age of 51.2 years for people born in Malta and the Maltese sample demographics (shown in table 1, in the method section) show a median age of 63 years. It makes sense that the study sample is a little older than the wider Maltese population, given that this study surveyed people with Type II diabetes, a disease that mostly develops later in life (McDonald, 2000).

Another example illustrating that the study sample represents population groups is level of education. The 1996 census suggests 44 percent of Malta-born people in Australia either left school prior to 15 years of age or never attended school. In the 1996 census, these figures were contrasted with the total Australian population in the same age group, in that 15.5 percent left school before age 15 years and 1 percent never attended school. Similarly, 35 percent of the Maltese sample in this study never attended school or had not completed primary school, compared to 4% of the Anglo-Saxon study sample (McDonald, 2000).

**8)** The eighth limitation refers to non-response bias associated with mail surveys, that is the participants who failed to return the completed questionnaire (62 percent) might have differed significantly from those who returned it, increasing the risk of error variance and threatening the representativeness of the conclusions. The almost equal response rate for Maltese (41%) and Anglo-Saxon (36%) participants, however,

reduced the likelihood that non-response-bias confounded ethnic differences. For example, that the two ethnic groups were similar in response rate, suggests they were also similar in their reasons for participating or not participating in the study, thus minimising statistical variability in the scores caused by the influence of variables other than ethnicity.

9) A ninth limitation is the difference in level of education between Maltese and Anglo-Saxon people. This difference in education may have confounded the ethnic differences found in the analyses. Education was not controlled for because there were numerous participants who did not provide this information. Prospective studies contrasting Maltese and Anglo-Saxon people may focus in on socio-economic variables, especially in relation to locus of control beliefs.

10) Another limitation to this thesis research is that of missing data. A number of participants did not answer all of the items that applied to each variable, therefore only existent data was utilised in the analyses.

11) The measures employed to indicate health beliefs were limited to the Western medical model of diabetes and healthcare. Alternative views of illness, such as folk models, were not taken into account (Wyshak, 2002). However, the present research was useful to investigating the reaction of different cultural groups to mainstream medicine.

12) A final limitation refers to the criteria used to select people with Type II Diabetes Mellitus. Sixteen percent of the people who participated in this thesis did not report the Type of Diabetes. Based on medication usage and age of diagnosis it was deduced that the 16 percent unreported cases consisted of people who had Type II Diabetes.

## 5.6 *Implications, Recommendations, and Conclusions*

### 5.61 **Major Findings and Implications for Future Research**

Several important implications for further research are apparent as a consequence of this thesis. The objectives pursued in this study have facilitated original contributions in seven areas of diabetes research.

- A new model for explaining the beliefs and attitudes that may underlie adherence to dietary treatment among people with Type II Diabetes Mellitus

emerged from this thesis. The new ‘Diabetes Dietary Adherence Model’ drew from two major frameworks in Health Psychology, the ‘health belief model’ and ‘locus of control’; and integrated them with three factors relatively understudied in diabetes research, age, ‘attitudes toward doctors’, and ‘food beliefs’. This study was conducted with a sample of Anglo-Saxon and Maltese people in Australia. Therefore, further research may test the ‘Diabetes Dietary Adherence Model’ with alternative cultural groups and with people who have other chronic illnesses that require dietary treatments.

- This thesis found stronger (health) ‘food beliefs’ linked to less ‘barriers to carrying out treatment’, ‘adherence to dietary treatment’, and fewer diabetes complications. Weaker (taste or enjoyment) ‘food beliefs’ were linked with ‘barriers to treatment’, poorer dietary adherence, and more diabetes complications. Prospective studies may explore the specific nature of these linkages by investigating whether people who have stronger ‘food beliefs’ have greater knowledge about the benefits of healthy eating; and whether people with weaker ‘food beliefs’ have more difficulty adhering to the dietary regimen because they prefer foods not usually included in diabetes dietary guidelines. Additionally, research may be conducted to develop the questions used in this thesis to indicate ‘food beliefs’ into a standardised questionnaire.
- Participants in the current study who had ‘positive attitudes toward doctors’ tended to have stronger ‘food beliefs’, and those people who perceived more ‘barriers to diabetes treatment’ were more likely to have ‘negative attitudes toward doctors’. In the light of these findings, future studies can investigate aspects of the doctor-patient relationship that may underlie these linkages. For instance, research may determine whether diabetes patients who have more ‘positive attitude towards doctors’ seek professional dietary advice more frequently and whether they are more willing to agree or accept the dietary advice offered by doctors. Moreover, further research may investigate the particular difficulties with treatment experienced by patients who have a fairly ‘negative attitude toward doctors’. Can improving the doctor-patient relationship assist in addressing barriers to diabetes treatment? Do some patients prefer peer or family support in treating diabetes compared to professional assistance?



- Age was found related to adherence, with younger participants revealing poorer adherence to dietary treatment. Future research may endeavor to understand the specific difficulties, concerns, and needs related to dietary treatment among younger people with Type II Diabetes.
- In this thesis lower 'internal health locus of control' was found related to greater 'perceived barriers to treatment', which in turn predicted dietary adherence. Further research may determine the direction of causality in this relationship. Do people with diabetes who perceive greater barriers to treatment consequently feel less empowered in the treatment process? Or, is it that people with 'internal health locus of control' adjust well to diabetes treatment? Moreover, would facilitating patient empowerment improve adherence to diabetes treatment? Or, would it be more effective to assess 'internal health locus of control beliefs' at the time of patient intake and subsequently adjust the focus of diabetes education to suit individual preferences?
- Relative to the Anglo-Saxon participants in this study, Maltese people had more 'powerful-others health locus of control' and stronger (positive and negative) 'attitudes toward doctors'. Professional consultation with doctors seemed important to Maltese patients in diabetes self-management. Future empirical research, therefore, may determine the issues that underlie positive and negative attitudes towards doctors among Maltese people with diabetes. Although there were ethnic differences found on health beliefs, there was no significant difference found between Maltese and Anglo-Saxon participants on dietary adherence. Considering Maltese participants had more 'negative attitudes toward doctors', another study, with a larger sample of Maltese people, may reveal ethnic differences in dietary adherence.
- Almost all the scales used to indicate the beliefs embedded in the 'health belief Model' produced skewed distributions. This problem has been reported in previous research using the same instruments (Jennings et al., 1991; Lewis et al., 1990). These findings make evident the need to improve the validity of these scales.

## 5.62 Recommendations for the Practice of Diabetes Management

This section will offer recommendations for the professional practice of diabetes management based on the results of this thesis. The recommendations may help design material to use in patient education about dietary treatment.

- The ‘Diabetes Dietary Adherence Model’ generated by this thesis demonstrates that patient education and counseling focused on beliefs and attitudes may promote adherence to dietary treatment. ‘Food beliefs’, ‘perceived barriers to treatment’, attitudes toward doctors’, and ‘internal health locus of control’ seem particularly important foci for effective patient education about dietary treatment.
- Patient education, counseling, and information about dietary treatment might emphasise the benefits of healthy eating for diabetes management and for health in general. Additionally, dietary advice may tackle concerns and preferences related to the taste or enjoyment of food. It may be useful to include popular recipes modified for diabetes management, along with nutritional information for common foods and typical meal plans. The questions used to explore ‘food beliefs’ may be used in a clinical setting to assess patient ‘beliefs about food’ and to help direct dietary advice.
- Effective patient education and counseling need to address the barriers to carrying out diabetes treatment experienced by patients.
- Diabetes patient education, counseling, and information might cover matters related to the patient-doctor relationship, with the aim of fostering positive relationships; for example, encouraging patients to openly communicate difficulties with treatment to their doctor. Moreover, informing patients about the variety of services available, particularly about their right to choose alternative doctors if they are not satisfied with the support they are getting. Equally important is educating diabetes professionals about the importance of the patient-doctor relationship to promoting treatment adherence; training doctors to address difficulties in relating to patients and also to increase professionals’ awareness of alternative service providers if they need to refer clients elsewhere.

- Culturally-appropriate diabetes education for Maltese Australian patients needs to focus on the collective: the relationships of patients with their family, peers, and doctors. Group or family education and support may promote better management of diabetes among Maltese clients. This thesis suggested that improving the patient-doctor relationship is particularly important for Maltese patients. Maltese people have relatively intense attitudes towards doctors, therefore, it is important to build on the strengths of the relationship between patient and doctor, and also to deal with obstacles that hinder that relationship.

### **5.63 Conclusion**

The impact of diabetes is huge to the individual, to society, and the economy. Empirical literature reviewed in this thesis indicates adherence to treatment can reduce the costs related to diabetes and its complications. This thesis identified psychosocial factors that may moderate regimen adherence. It is hoped that the findings presented will provide a further step in understanding the complexity and importance of this dynamic.

## 6 Glossary

**Diabetes Mellitus:** is characterised by pancreatic dysfunction, impaired insulin secretion, liver glucose production, reduced muscle glucose uptake, and high blood glucose levels, hyperglycemia. The term diabetes refers to Diabetes Mellitus throughout this thesis.

**Type I Diabetes Mellitus:** is characterised by total dysfunction of insulin secretion and development of ketoacidosis in the absence of insulin therapy. It is usually defined by rapid onset, manifestation in childhood, and recent weight loss.

**Type II Diabetes Mellitus:** is characterised by impaired insulin secretion, milder hyperglycemia, rare ketoacidosis, and a slow onset. It typically manifests after 30 years of age, in people who have a strong family history of diabetes and the tendency to be overweight.

**Glycated Haemoglobin (HbA1c):** is a blood test indicating the average blood glucose value over a six-to-eight-week period.

**Health behaviour:** is any activity undertaken for the sake of improving health, preventing ill health, treating illness, or curing illness, such as treatment behaviour, also referred to as treatment adherence (Glanz, 1997).

**Treatment Adherence:** refers to the extent to which a patient follows medical recommendations. The term is taken to be less pejorative than treatment compliance. Adherence describes a conscious co-operation and consent, while compliance implies a submission to medical orders. The operationalisation of treatment adherence varies. For instance, the level of treatment adherence can be measured via behavioural indicators (e.g., self-reports, doctor reports), physiological outcomes, or by other means (e.g., pill counts). Diabetes treatment adherence refers to the extent to which a patient adopts medical recommendations (e.g., diet) for the treatment of diabetes and the prevention of complications (Myers & Midence, 1998).

**Health Belief:** is the emotional and cognitive acceptance of some proposition, statement, or doctrine related to health, illness, or medicinal treatment (Corsini, 2002).

**Health Belief Model:** is a framework for understanding the beliefs that may determine health behaviour. It includes the ‘perceived susceptibility and severity of a health threat’ and the ‘perceived benefits and barriers to carrying out a healthy action’.

**Health Locus of Control:** refers to whether a health outcome is perceived as contingent upon one’s own behaviour (‘internal health locus of control’), whether it is perceived as contingent upon the behaviour of family, friends, or health professionals (external, ‘powerful-others health locus of control’), or whether a health outcome is perceived as dependent upon forces of fate or luck (external, ‘chance health locus of control’).

**Food Beliefs:** are defined as beliefs about any physiological, psychological, social, or cultural purpose of food and eating. For example, people may believe eating is primarily a means of promoting health or they may believe it is a means of obtaining taste or enjoyment.

**Attitude toward Medical Doctors:** has four dimensions: cognitive, affective, evaluative, and conative. The cognitive dimension refers to a belief or opinion about medical doctors. The affective dimension refers to feelings about doctors. The evaluative dimension refers to a negative or positive tone and the conative dimension refers to a disposition for action toward medical doctors.

**Ethnicity/Culture:** refers to a people’s shared beliefs, traditions, values, knowledge, norms, and material artefacts (Meyerowitz, Richardson, Hudson, & Leedham, 1998). Culture or cultural tradition “means anything which is transmitted or handed down from the past to the present.” It is not static, but “develops, changes, and renews itself in the course of its transmission across time and social space. What is transmittable are the patterns of action [and] the beliefs requiring, recommending, regulating, permitting, or

prohibiting the re-enactment of these patterns” (Abela, 1991, p. 5). The terms ethnicity and culture, ethnic and cultural, are used inter-changeably in this thesis.

**Cultural/Ethnic Group:** is a group with distinctive ancestry, traditions, and/or identity (Reber, 1985). The characteristics shared by people within an ethnic group may be due to common geographical, historical, political, economic, and/or psychosocial factors (Meyerowitz et al., 1998). For example, an ethnic group may have a common history of migration, similar levels of education and work skills obtained in the country of origin, shared patterns of social or family interaction and spiritual beliefs.

This thesis will use generic terms such as Maltese, Hispanic, Black, White, American, Australian, and Asian to efficiently specify or differentiate the cultural background of a particular group, community, or country of people. It must be acknowledged that each referent group most probably contains several sub-groups with different cultures or lifestyles.

Terms such as Western, Eastern, collective, individualistic, and minority ethnic groups are used to describe different aspects of ethnicity. These terms are umbrella terms, not specific or exhaustive, employed to effectively compare people of many ethnic groups. Use of such terms does not imply that referent groups are homogeneous, but that numerous ethnic groups can have some common characteristics.

**Ethnic Minority Group:** is a group which is smaller in number than the rest of the population of a state, whose members have ethnic, religious, or linguistic features that are different from those of the rest of the population (e.g., a migrant group) (Meyerowitz et al., 1998).

**Collectivism versus Individualism:** is a core theme in Cross-cultural Psychology. According to Triandis (1995), the distinction between collectivist and individualistic cultures is based on four dimensions. First, the definition of self is interdependent in collectivist cultures and independent in individualistic cultures. Second, personal and communal goals are closely aligned in collectivism and not aligned in individualism. Third, cognitions that focus on norms, obligations, and duties guide much of social behaviour in collectivism; and cognitions that focus on personal needs, rights, and

attitudes guide much of social behaviour in individualistic cultures. Fourth, in collectivist cultures the emphasis is upon relationships, while in individualistic cultures the focus is on rational analysis of the personal advantages of maintaining a relationship.

**Western Medicine:** refers to mainstream healthcare. It generally encapsulates ideas practices related to health and illness that originated in Western Europe.

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## 8 Appendices



## Appendix 1: Demographic Items in the Questionnaire

1. Please specify your sex                      Female     Male
2. Age in years .....
3. Your country of birth .....
4. Your mother's country of birth .....
5. Your father's country of birth .....
6. Please indicate your religious denomination:
  - Buddhist
  - Roman Catholic
  - Protestant
  - Hindu
  - Mueslim
  - Other .....
7. How old were you when you were diagnosed with diabetes? .....
8. What type of diabetes do you have?        Type I     Type II
9. My doctor prescribes insulin injections for me to treat my diabetes Yes  No
10. My doctor prescribes tablets for me to treat my diabetes                      Yes  No
11. How well do you speak English?
  - No at all
  - A little
  - Fairly well
  - Very well
12. How long have you lived in Australia? .....
13. Please specify the highest level of education you obtained:
  - Never attended school
  - Uncompleted primary school
  - Uncompleted high school
  - Completed high school
  - Completed diploma or certificate
  - Completed tertiary
  - Completed postgraduate studies

## Appendix 2: Summary of Diabetes Self-care Activities Questionnaire

Constructed by Marquis & Ware (1979)

Adapted from *Handbook of Psychology and Diabetes* (p. 355), edited by C. Bradley, 1994,  
Poststrasse, Switzerland: Harwood Academic.

Please circle the number on each of the scales that best relates to your experience

|  | Never |   |   |   | Always |
|--|-------|---|---|---|--------|
| 14 How often do you follow your recommended diet?  | 0     | 1 | 2 | 3 | 4      |
| 15 How often do you successfully limit your kilojoules (calories) as recommended in healthy eating for diabetes management?  | 0     | 1 | 2 | 3 | 4      |
| 16 How often do your meals include high fibre foods, (such as fresh fruits and vegetables, whole grain breads, dried beans, rice, pasta)?  | 0     | 1 | 2 | 3 | 4      |
| 17 How often do your meals include high fat foods (such as butter, ice cream, oil, nuts and seeds, mayonaise, avocado, deep-fried food, salad dressing, bacon, other meat with fat or skin)? | 0     | 1 | 2 | 3 | 4      |
| 18 How often do your meals include sweets and deserts (such as cake, soft drinks, biscuits)?   | 0     | 1 | 2 | 3 | 4      |
| 19 How often do you test your glucose (blood sugar) level?   | 0     | 1 | 2 | 3 | 4      |
| 20 How often do you do the glucose (blood sugar or urine) tests recommended by your doctor?  | 0     | 1 | 2 | 3 | 4      |
| 21 How often do you take the insulin injections recommended by your doctor?  | 0     | 1 | 2 | 3 | 4      |
| 22 How often do you take the tablets recommended by your doctor?   | 0     | 1 | 2 | 3 | 4      |

**Please make sure you have answered all the questions**

### Appendix 3: Experience of Treatment Benefits and Barriers Scale

Constructed by Lewis, Jennings, Ward, & Bradley (1990)

Adapted from *Handbook of Psychology and Diabetes* (p. 264), edited by C. Bradley, 1994, Poststrasse, Switzerland: Harwood Academic.

Please circle the number on each of the scales to indicate how strongly you agree or disagree with each of the following statements

|    |  | Strongly Disagree |   |   |   |   | Strongly Agree |   |
|----|--|-------------------|---|---|---|---|----------------|---|
| 23 | By careful planning of diet and exercise, I can control my diabetes  | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 24 | Sticking to my diet makes it difficult to eat take-away food or to eat at a restaurant   | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 25 | High blood sugars can be prevented if I plan ahead   | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 26 | It is impossible to control my diabetes properly and live in the way I would like  | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 27 | Sticking to my diet causes inconvenience to other people   | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 28 | Controlling my diabetes well interferes with social life   | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 29 | Good control of my diabetes reduces the possibility of developing complications  | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 30 | It is important to take all my tablets at the times recommended by my doctor if I am to achieve good management of my diabetes | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 31 | The diet I am supposed to follow is boring and uninteresting   | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |
| 32 | I find that keeping to a diet is helpful in controlling my diabetes  | 0                 | 1 | 2 | 3 | 4 | 5              | 6 |

Please make sure you have answered all the questions

#### Appendix 4: Food Belief Items in the Questionnaire

Please circle the number on each of the scales that indicates how strongly you agree or disagree with each of the following statements

|  | <i>Strongly Disagree</i> |   |   | <i>Strongly Agree</i> |   |   |   |
|--|--------------------------|---|---|-----------------------|---|---|---|
| 33 I love food and dislike restrictions on what I can eat                          | 0                        | 1 | 2 | 3                     | 4 | 5 | 6 |
| 34 I often overeat because the food tastes so good                                 | 0                        | 1 | 2 | 3                     | 4 | 5 | 6 |
| 35 Eating healthy foods is more important than the taste of the food               | 0                        | 1 | 2 | 3                     | 4 | 5 | 6 |
| 36 I often eat foods because of how they taste, even when they are not good for me | 0                        | 1 | 2 | 3                     | 4 | 5 | 6 |
| 37 I consider the ingredients of the foods I choose to eat                         | 0                        | 1 | 2 | 3                     | 4 | 5 | 6 |
| 38 I choose the food I eat because it is good for my body                          | 0                        | 1 | 2 | 3                     | 4 | 5 | 6 |

**Please make sure you have answered all the questions**

## Appendix 5: Attitudes toward Doctors and Medicine Scale

Constructed by Marteau (1990)

Adapted from *Measures in Health Psychology: A User's Portfolio* (p. 9), by M. Johnston, S. Wright, & J. Weinman, 1995, Berkshire, NFER Nelson

Please the number on each of the scales that indicates how strongly you agree or disagree with each of the following statements

|  | <i>Strongly Disagree</i> |   |   |   |   | <i>Strongly Agree</i> |
|--|--------------------------|---|---|---|---|-----------------------|
|  | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 39 All doctors are good doctors  | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 40 I would consult a doctor when I am seriously ill                            | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 41 I have absolute faith and confidence in all hospital doctors                | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 42 Doctors blame their patients if their treatments do not work                | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 43 No matter how long you have to wait to see a doctor, it's worth it          | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 44 Doctors are important to keeping us healthy                                 | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 45 No two doctors will agree on what is wrong with a person                    | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 46 Doctors are too ready to solve patients' problems by prescribing medication | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 47 Doctors know what's best for you  | 1                        | 2 | 3 | 4 | 5 | 6                     |
| 48 I don't like medical people   | 1                        | 2 | 3 | 4 | 5 | 6                     |

**Please make sure you have answered all the questions**

**Appendix 6: Multidimensional Health Locus of Control Scale (Form A)** (refer to following page)  
**Constructed by Wallston, Wallston, & DeVellis (1978)**  
Adapted from *Multidimensional Health Locus of Control Scales*, [world wide web], Page by K.A. Wallston, Available: <http://www.vanderbilt.edu/nursing/kwallston/mhlescales.htm> [2003, April].

Please circle the numbers on each of the scales that indicates how strongly you agree or disagree with each of the following statements

Strongly Disagree

|    |  |   |   |   |   |   |   |
|----|--|---|---|---|---|---|---|
| 49 | If I get sick, it is my own behavior which determines how soon I get well again  | 1 | 2 | 3 | 4 | 5 | 6 |
| 50 | No matter what I do, if I am going to get sick, I will get sick  | 1 | 2 | 3 | 4 | 5 | 6 |
| 51 | Having regular contact with my physician is the best way for me to avoid illness   | 1 | 2 | 3 | 4 | 5 | 6 |
| 52 | Most things that affect my health happen to me by accident   | 1 | 2 | 3 | 4 | 5 | 6 |
| 53 | Whenever I don't feel well, I should consult a medically trained professional  | 1 | 2 | 3 | 4 | 5 | 6 |
| 54 | I am in control of my health   | 1 | 2 | 3 | 4 | 5 | 6 |
| 55 | My family has a lot to do with my becoming sick or staying healthy   | 1 | 2 | 3 | 4 | 5 | 6 |
| 56 | When I get sick, I am to blame   | 1 | 2 | 3 | 4 | 5 | 6 |
| 57 | Luck plays a big part in determining how soon I will recover from an illness   | 1 | 2 | 3 | 4 | 5 | 6 |
| 58 | Health professionals control my health   | 1 | 2 | 3 | 4 | 5 | 6 |
| 59 | My good health is largely a matter of good fortune   | 1 | 2 | 3 | 4 | 5 | 6 |
| 60 | The main thing which affects my health is what I myself do   | 1 | 2 | 3 | 4 | 5 | 6 |
| 61 | If I take care of myself, I can avoid illness  | 1 | 2 | 3 | 4 | 5 | 6 |
| 62 | Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me | 1 | 2 | 3 | 4 | 5 | 6 |
| 63 | No matter what I do, I'm likely to get sick  | 1 | 2 | 3 | 4 | 5 | 6 |
| 64 | If it's meant to be, I will stay healthy   | 1 | 2 | 3 | 4 | 5 | 6 |
| 65 | If I take the right actions, I can stay healthy  | 1 | 2 | 3 | 4 | 5 | 6 |
| 66 | Regarding my health, I can only do what my doctor tells me to do   | 1 | 2 | 3 | 4 | 5 | 6 |

**Please make sure you have answered all the questions**

## Appendix 7: Beliefs about Severity Scale

Constructed by Lewis, Jennings, Ward, & Bradley (1990)

Adapted from *Handbook of Psychology and Diabetes* (p. 265), edited by C. Bradley, 1994, Poststrasse, Switzerland: Harwood Academic.

Please circle the number on each of the scales that indicates how serious you think the following problems would be if you were to develop them. If you do not know what the problem is, please tick the box on the right hand side.

|                                    | <i>not serious at all</i> |   |   |   |   | <i>extremely serious</i> | <i>I don't know what the problem is</i> |
|------------------------------------|---------------------------|---|---|---|---|--------------------------|---|
|                                    | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 67 High blood pressure             | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 68 Stomach ulcer                   | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 69 Blindness                       | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 70 Ear infection                   | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 71 Kidney disease                  | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 72 Aching Legs                     | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 73 Leukaemia (Cancer of the blood) | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 74 Gum disease                     | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 75 Bronchitis                      | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 76 Deafness                        | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 77 Numbness in your feet           | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 78 Heart disease                   | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 79 Asthma                          | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 80 Failing eyesight                | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 81 Poor hearing                    | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 82 Gangrene                        | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 83 Your diabetes now               | 0                         | 1 | 2 | 3 | 4 |                          |   |
| 84 Your diabetes in 10 years       | 0                         | 1 | 2 | 3 | 4 |                          |   |

**Please make sure you have answered all the questions**



## Appendix 8: Beliefs about Vulnerability Scale

Constructed by Lewis, Jennings, Ward, & Bradley (1990)

Adapted from *Handbook of Psychology and Diabetes* (p. 266-7), edited by C. Bradley, 1994, Poststrasse, Switzerland: Harwood Academic.

Please circle the number on each of the scales that indicates how likely you feel it is that you will develop the following problems. If you have already got the problem, please tick the box on the right hand side

|     |                                     | very unlikely |   |   | very likely |   |                          |
|-----|-------------------------------------|---------------|---|---|-------------|---|--------------------------|
| 85  | High blood pressure                 | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 86  | Stomach ulcer                       | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 87  | Blindness                           | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 88  | Ear infection                       | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 89  | Kidney disease                      | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 90  | Aching Legs                         | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 91  | Leukaemia (Cancer of the blood)     | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 92  | Gum disease                         | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 93  | Bronchitis                          | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 94  | Deafness                            | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 95  | Numbness in your feet               | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 96  | Heart disease                       | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 97  | Asthma                              | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 98  | Failing eyesight                    | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 99  | Poor hearing                        | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 100 | Gangrene                            | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |
| 101 | Complications arising from Diabetes | 0             | 1 | 2 | 3           | 4 | <input type="checkbox"/> |

*I have already got the problem*

**Please make sure you have answered all the questions**

## Appendix 9a: Victoria University Letter of Project Approval

**Victoria University of Technology**  
 PO Box 14428  
 MELBOURNE CITY MC VIC 8001  
 AUSTRALIA

**Committee for  
 Postgraduate Studies**  
 Telephone  
 (03) 9688 4587  
 Facsimile  
 (03) 9688 4559

3045268

17 November 1999

Ms Kylie Bartolo  
 73 Joan Street  
 West Sunshine 3020



Dear Ms Bartolo,

I am pleased to inform you that at the 11 November 1999 meeting of the Committee for Postgraduate Studies it was recommended that you be admitted to candidature for the degree of Doctor of Philosophy with the thesis topic and supervisors as detailed below:

**Thesis Title:** Health Beliefs and Diabetes Behaviour Among Maltese, Vietnamese and Anglo-saxon Australians

**Principal Supervisor:** Dr Gordon Emmerson, Department of Psychology, St Albans Campus

**Co Supervisor:** Dr Gerrard Kennedy, Department of Psychology, St Albans Campus

I would like to take this opportunity to wish you the best in your studies.

If you have any queries about your candidature please do not hesitate to contact me on 9688 4522.

Yours sincerely,



Gabrielle Smales  
**Secretary to Committee for Postgraduate Studies**

cc Associate Professor Dorothy Bruck, Head, Department of Psychology, St Albans Campus  
 Dr Gordon Emmerson, Department of Psychology, St Albans Campus  
 Dr Gerrard Kennedy, Department of Psychology, St Albans Campus

Campuses at City,  
 Footscray, Melton,  
 St Albans, Sunbury  
 and Weribee

## Appendix 9b: Victoria University Letter of Ethics Approval

Victoria University of Technology

St Albans Campus

**Memorandum**

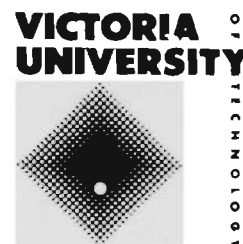
REF: ETH0181

TO: Dr Gordon Emmerson  
Department of Psychology

FROM: Dr Carolyn Rasmussen  
Acting Chair, Faculty of Arts  
Human Research Ethics committee

DATE: 14 September 1999

SUBJECT: ***HRETH.FOA.0039/99 involving human subjects***



The Faculty of Arts Human Research Ethics Committee at its meeting on 10 September 1999 considered application for project:

***Beliefs and Diabetes Behaviour among Australlans of Maltese, Vietnamese and Anglo Saxon Ethnic Groups***

It was resolved to approve application HRETH.FOA.0039/99 from 1 September 1999 to 1 October 2000.

*Dr Carolyn Rasmussen*

## Appendix 10: Diabetes Australia Letter of Project Approval



## DIABETES AUSTRALIA – Victoria

3<sup>rd</sup> Flr., 100 Collins St.,  
Melbourne 3000

PO Box 205D  
Melbourne 3001

Tel: (03) 9654 8777  
Toll Free: 1800-640-862  
Fax: (03) 9650 1917  
E-mail: [adv@ada.org.au](mailto:adv@ada.org.au)

ACN 10526312

5th August, 1999

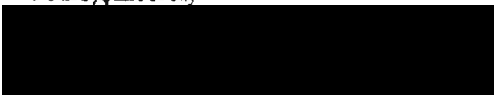
Kylie Bartolo  
Victoria University  
Psychology Department  
MCMC SO89  
Po Box 14428  
Melbourne  
Victoria 8001

Re: Doctor of Philosophy Research Thesis entitled "Beliefs and diabetes behaviour among Australians of Maltese, Vietnamese and Anglosaxon ethnic groups."

Dear Kylie

The prospective study is both interesting and worthwhile. Diabetes Australia (Victoria) will be pleased to facilitate recruitment and questionnaire administration, to be carried out by yourself at the Sunshine branch, provided that the project is approved by Victoria University and the study protocol is forwarded to all relevant parties for subsequent approval by Diabetes Australia.

Yours Sincerely

  
Dr/Alison Nankervis  
Medical Advisor

  
Patricia Streitbergen  
Nursing Services Manager

## **Appendix 11: Permission for Use of Questionnaires**

**22<sup>nd</sup> December 1999**

**(1) ROYAL HOLLOWAY, UNIVERSITY OF LONDON**

**(2) PROFESSOR CLARE BRADLEY**

**(3) MS KYLIE BARTOLO**

### **AGREEMENT**

for use of the English of the Health Beliefs Questionnaire (Type 2; latest rev. 9.9.93) and use in a study of Health Beliefs and treatment adherence among Maltese and Anglo-Saxon Australians at Diabetes Australia (Sunshine) and Victoria University (St Albans), Australia.

**THIS AGREEMENT** dated 22<sup>nd</sup> December 1999 is made **BETWEEN**:

- (1) **ROYAL HOLLOWAY AND BEDFORD NEW COLLEGE** whose administrative offices are at Egham, Surrey TW20 0EX, England ("the College");
- (2) **CLARE BRADLEY** of the College's Department of Psychology ("Prof Bradley"); and
- (3) **KYLIE BARTOLO** of Victoria University, whose administrative offices are at MCMC SO89, PO Box 14428, Victoria 8001, Australia ("Ms Bartolo").

## 1. BACKGROUND AND DEFINITIONS

- 1.1 The College and Prof Bradley agree to supply to Ms Bartolo strictly for her non-commercial use in a study of Health Beliefs and treatment adherence of Maltese and Anglo-Saxon Australians ("the Study"), a copy of the questionnaires ("the Questionnaires") with the following titles,

HEALTH BELIEFS SCALE: latest rev. 9.9.93

for use with an Anglo-Saxon and Maltese population in Australia.

- 1.2 Copyright in the Questionnaires is vested in Prof Bradley.

## 2. GRANT OF LICENCE

- 2.1 The College and Prof Bradley grant to Ms Bartolo the following non-exclusive, non-transferable rights and licences:
- 2.1.1 the right to translate the Questionnaires into Maltese. Ms Bartolo will conduct a minimum of two parallel backtranslations on each of the initial translations into Maltese, with additional retranslations/backtranslations as required. Ms Bartolo will supply copies of all backtranslations, retranslations and documentation containing notes and comments on the process of backtranslation and retranslation.
  - 2.1.2 the right to make as many copies of the Questionnaires and the Translated Questionnaires as are reasonably necessary for the purpose of the Study: these copies will be supplied only to persons who need to make use of them in the Study, and Ms Bartolo will take every precaution to ensure that they are not used for any other purpose.
- 2.2 Prior to commencement of the Study Ms Bartolo will supply Prof Bradley with a copy of the final translation of each of the Translated Questionnaires, in the format in which they are to be used in the Study, to be appended to this agreement.
- 2.3 Ms Bartolo will check the psychometric properties of the Translated Questionnaires and will supply Prof Bradley with summaries of these results, together with summaries of the results of the Study and any reports of the work as soon as they are available (unpublished or published) and, if requested, will provide a copy of anonymised data from the Study for the purposes of furthering the development of the Translated Questionnaires. Access to such data will not be expected

later than eighteen (18) months after receipt of the psychometric results and the final report of the work.

### 3. COPYRIGHT

3.1 Title to the copyright in the Questionnaires and the Translated Questionnaires shall vest in Prof Bradley.

3.2 Every new translation of the Questionnaires shall carry the following copyright notices:

ADDLoC © Prof Clare Bradley: 28.11.97; Maltese translation: *[date]* (of English revision dated 3.11.98).

Diabetes Research Group, Dept of Psychology, Royal Holloway, University of London, Egham, Surrey, TW20 0EX.

Translation conducted by: Kylie Bartolo

Health Beliefs Type 2 © Prof Clare Bradley: 9.9.93; Maltese translation: *[date]* (of English revision dated 9.9.93).

Diabetes Research Group, Dept of Psychology, Royal Holloway, University of London, Egham, Surrey, TW20 0EX.

Translation conducted by: Kylie Bartolo

### 4. LIMITATION OF LIABILITY

4.1 Ms Bartolo understands that the Questionnaires are experimental in nature, and that the College and Prof Bradley make no representations and extend no warranties of any kind, either express or implied. There are no express or implied warranties of quality or fitness for a particular purpose or that the use of the Questionnaires or the Translated Questionnaires will not infringe any patent, copyright, trademark, or other rights.

4.2 In no event shall either the College or Prof Bradley be liable for any use which is made of the Questionnaires or the Translated Questionnaires, and Ms Bartolo agrees to defend, indemnify, and hold both the College and Prof Bradley harmless from any loss, claim, damage, or liability which may arise from or in connection with such use.

4.3 The liability of any party for any breach of this Agreement, or arising in any other way out of the subject-matter of this Agreement, will not extend to any incidental or consequential damages or losses including (without limitation) loss of profits.

4.4 If any sub-clause of this clause 4 is held to be invalid or unenforceable under any applicable statute or rule of law, then it shall be deemed to be omitted, and if as a result any party becomes liable for loss or damage which would otherwise have been excluded then such liability shall be subject to the remaining sub-clauses of this clause 4.

### 5. TERMINATION

5.1 This Agreement may be terminated by any party for any breach of the obligations set out in the Agreement, by giving thirty (30) days' written notice to the others of its or her intention to terminate. The notice shall include a detailed statement describing the nature of the breach. If the breach is capable of being remedied and is remedied within the thirty-day notice period, then the termination shall not take effect. If the breach is of a nature such that it can be fully remedied but not within the thirty-day notice period, then termination shall also not be effective if the party

involved begins to remedy the breach within that period, and then continues diligently to remedy the breach until it is remedied fully. If the breach is incapable of remedy, then the termination shall take effect at the end of the thirty-day notice period in any event.

- 5.2** This Agreement may be terminated by any party without cause at any time from eighteen (18) months after receipt by Prof Bradley of the final report of the work, on giving not less than forty-five (45) days' written notice to the other parties of its or her intention to terminate.
- 5.3** The termination of this Agreement under clauses 5.1 or 5.2, shall mean the termination, as from the effective date of termination, of the rights and obligations in clauses 2 and 4. The remaining clauses shall survive the termination of this Agreement, for whatever reason.

## **6. ACKNOWLEDGEMENTS**

- 6.1** Ms Bartolo will acknowledge the source of the Questionnaires in any communication reporting on their use or on the use of the Translated Questionnaires.
- 6.2** Prof Bradley will cite Ms Bartolo in any publications in which data supplied to Prof Bradley by Ms Bartolo are cited.
- 6.3** Neither the College (in relation to Ms Bartolo) nor Ms Bartolo (in relation to the College and Prof Bradley) shall use the name of another party in any press release or product advertising, or for any other commercial purpose, without the prior written consent of the other; provided, however, that publication of the collaboration with Ms Bartolo in the Annual Reports and similar publications of the College and the University of London shall not be regarded as a breach of this clause.

## **7. ASSIGNMENT**

No party shall assign any of its or her rights and obligations under this Agreement without the prior written consent of both the others.

## **8. NOTICES**

- 8.1** The College's representative for the purpose of receiving notices shall until further notice be:

Prof Clare Bradley  
 Psychology Department  
 Royal Holloway and Bedford New College  
 EGHAM  
 Surrey TW20 0EX  
 England

- 8.2** Ms Bartolo will until further notice be the representative for the Study for the purpose of receiving notices:

Ms Kylie Bartolo  
 MCMC SO89  
 PO Box 14428  
 Melbourne 8001  
 Victoria  
 Australia



## 9. GENERAL

- 9.1** Clause headings are inserted in this Agreement for convenience only, and they shall not be taken into account in the interpretation of this Agreement.
- 9.2** Nothing in this Agreement shall create, imply or evidence any partnership or joint venture between the parties or the relationship between any of them of principal and agent.
- 9.3** This Agreement constitutes the entire agreement between the parties for the translation of the Questionnaires and use of the Translated Questionnaires. Any variation shall be in writing and signed by or on behalf of all the parties.
- 9.4** This Agreement shall be governed by English Law. The English Courts shall have exclusive jurisdiction to deal with a dispute which has arisen or may arise out of or in connection with this Agreement, unless the College voluntarily submits itself to the jurisdiction of some other tribunal.
- 9.5** If any one or more clauses or sub-clauses of this Agreement would result in this Agreement being prohibited pursuant to Article 85(1) of the Treaty of Rome, then it or they shall be deemed to be omitted. The parties shall uphold the remainder of this Agreement and shall negotiate an amendment which, as far as legally feasible, maintains the economic balance between the parties.

AS WITNESS the hands of authorised signatories for the parties on the date first mentioned above.

**THE SCHEDULE**

**The Protocol**

(See attached)

**SIGNED on behalf of  
ROYAL HOLLOWAY AND  
BEDFORD NEW COLLEGE**

**SIGNED by KYLIE BARTOLO**

Name: MRS J ROSS  
.....

Position: Director of Finance  
.....

Position: Ph.D. candidate

Signature:   
.....

Signature:   
.....

Date: 22/12/99  
.....

Date: 8/1/00  
.....

**SIGNED by PROFESSOR CLARE BRADLEY**

Signature:   
.....

Date: 22.12.99  
.....

## **Appendix 12a: Plain Language Statement for Maltese Research Participants**

### **A Study of Diabetes in Maltese People**

Thank you for agreeing to fill in this questionnaire. Diabetes is an important problem for Maltese people, so I would like to learn how Maltese people manage diabetes and the Healthcare needs of Maltese people with diabetes. I am a university student and this project will form part of my postgraduate research work. The information will also assist in planning better support and patient education programs for Maltese people.

I would like to invite you to participate in this study by filling in a questionnaire about how you manage your diabetes and your beliefs about diabetes. It will probably take about 20 minutes to answer the questions. I am Maltese, so you can do the questionnaire in Maltese if you wish. I will be available to help you if you have any queries.

Your answers to the questions will be kept private and confidential. The questionnaire will not have your name on it. Individual information will not be available to anyone except myself.

You can withdraw from this study at any time if you like. Your participation is entirely voluntary and whether you participate or not you will continue to receive the best possible health care.

I will be available to speak to you at any time about any worries or questions relating to any part of the study and can be contacted by telephone. You may like to discuss this study with your diabetes educator.

You may like to learn more about preventing diabetes complications and managing diabetes. There are information sessions held each week by Diabetes Australia (Sunshine). You are invited to attend these sessions and I would be pleased to give you the details.

If you would like a copy of the results of the study when it has been completed, please contact me.

Thank you for your valuable contribution.

Kylie Bartolo

Mobile: 0412 506 199

## **Appendix 12b: Plain Language Statement for Anglo-Saxon Research Participants**

### **A Study of Diabetes in Anglo-Saxon Australian People**

Thank you for agreeing to fill in this questionnaire. Diabetes is an important problem for Australian people, so I would like to learn how people in Australia manage diabetes and the Healthcare needs of Australian people with diabetes. I am a university student and this project will form part of my postgraduate research work. The information will also assist in planning better support and patient education programs.

I would like to invite you to participate in this study by filling in a questionnaire about how you manage your diabetes and your beliefs about diabetes. It will probably take about 20 minutes to answer the questions. I will be available to help you if you wish.

Your answers to the questions will be kept private and confidential. The questionnaire will not have your name on it. Individual information will not be available to anyone except myself.

You can withdraw from this study at any time if you like. Your participation is entirely voluntary and whether you participate or not you will continue to receive the best possible health care.

I will be available to speak to you at any time about any worries or questions relating to any part of the study and can be contacted by telephone. You may like to discuss this study with your diabetes educator.

You may like information about preventing diabetes complications and managing diabetes. There are information sessions held regularly by the Western Region Health Centre (Footscray) and Diabetes Australia (Sunshine). You are invited to attend any of these programs and I would be pleased to give you the details.

If you would like a copy of the results of the study when it has been completed, please contact me by telephone.

Thank you for your valuable contribution.

Kylie Bartolo

Mobile: 0412 506 199

## Appendix 13a: Consent Form for Maltese Research Participants

### Consent Form for Maltese Participants

#### INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study into how Maltese people manage diabetes and their beliefs about diabetes

#### CERTIFICATION BY PARTICIPANT

I, [name]  
of [address, this is optional]

am over 17 years old and I am voluntarily giving my consent to participate in the study entitled **A study of diabetes in Maltese people**

being conducted at Victoria University of Technology by **Kylie Bartolo**

I am aware that the questionnaire includes questions about how I manage diabetes and my beliefs about diabetes. I am also aware that this project will form part of Kylie Bartolo's postgraduate research work

and that I freely consent to participating in the study which involves

**completion of a questionnaire, which will take about 20 minutes.**

I have had the opportunity to have any questions answered and I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed: .....

Witness other than the experimenter:

Date: .....

.....

Any queries about your participation in this project may be directed to the researcher (Ms. Kylie Bartolo: ph. 0412 506 199). If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no: 03-9688 4710).

## Appendix 13b: Consent Form for Anglo-Saxon Research Participants

### Consent Form for Anglo-Saxon Participants

#### INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study into **how Australian people manage diabetes and their beliefs about diabetes**

#### CERTIFICATION BY SUBJECT

I, [name]  
of [address, this is optional]

am over 17 years old and I am voluntarily giving my consent to participate in the study entitled **A study of diabetes in Australian people**

being conducted at Victoria University of Technology by **Kylie Bartolo**

I am aware that the questionnaire includes questions about how I manage diabetes and my beliefs about diabetes. I am also aware that this project will form part of Kylie Bartolo's postgraduate research work

and that I freely consent to participating in the study which involves

#### completion of a questionnaire, which will take about 20 minutes.

I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed: .....

Witness other than the experimenter:

Date: .....

.....

Any queries about your participation in this project may be directed to the researcher (Ms. Kylie Bartolo: ph. 0412 506 199). If you have any queries or complaints about the way you have been treated, you may contact the Secretary, University Human Research Ethics Committee, Victoria University of Technology, PO Box 14428 MCMC, Melbourne, 8001 (telephone no: 03-9688 4710).

### Appendix 14: Table of Descriptive Statistics for all Variables

For illustration purposes, a mean of seven and a standard deviation of one have been employed for all scales in the following descriptives.

#### Means and Standard Deviations for Maltese Participants

| Variable                                | N  | Mean | Standard Deviation |
|---|----|------|--------------------|
| Food Beliefs                            | 46 | 6.92 | 1.12               |
| Internal Health Locus of Control        | 42 | 7.24 | 1.02               |
| Powerful-Others Health Locus of Control | 42 | 7.37 | 0.98               |
| Chance Health Locus of Control          | 42 | 7.19 | 0.97               |
| Negative Attitudes toward Doctor        | 44 | 7.29 | 0.91               |
| Positive Attitudes toward Doctor        | 46 | 7.34 | 0.91               |
| Dietary Adherence                       | 37 | 6.88 | 1.11               |
| Perceived Barriers to Treatment         | 42 | 7.12 | 1.05               |

#### Means and Standard Deviations for Anglo-Saxon Participants

| Variable                                | N  | Mean | Standard Deviation |
|---|----|------|--------------------|
| Food Beliefs                            | 92 | 7.04 | 0.94               |
| Internal Health Locus of Control        | 88 | 6.88 | 0.97               |
| Powerful-Others Health Locus of Control | 88 | 6.82 | 0.96               |
| Chance Health Locus of Control          | 83 | 6.91 | 1.01               |
| Negative Attitudes toward Doctor        | 89 | 6.86 | 1.01               |
| Positive Attitudes toward Doctor        | 90 | 6.82 | 1.01               |
| Dietary Adherence                       | 80 | 7.05 | 0.95               |
| Perceived Barriers to Treatment         | 86 | 6.94 | 0.97               |