Social support, automatic thought processes and coping style as predictors of compliance with treatment among adult diabetes patients in Northland

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ABSTRACT

Little research has examined the relationship of automatic negative thought patterns, coping styles and depression to compliance with treatment for diabetes. A questionnaire consisting of demographic questions, the Ways of Coping Checklist, the Automatic Thoughts Questionnaire, a depression inventory and a compliance rating scale was completed by 114 adult diabetes patients attending the Northland Health retinopathy clinic. There were equal numbers of men and women, whose median age was 59 years ($M = 59.2$, $SD = 14.9$). Clinicians who were responsible for one or more of the patients independently completed a separate compliance rating scale for their respective patient(s). Multivariate analysis of variance revealed that there were no significant overall difference for gender and ethnic identity on any of the variables. Automatic negative thoughts, avoidance and blaming coping styles were positively related to depression, and negatively related to patients' ratings of compliance. A problem focus coping style correlated positively with patients' ratings of compliance. Patients tended to rate their own compliance as better than the staff ratings. According to staff ratings, Maori patients who identified less strongly with their culture, were also less likely to comply with treatment than the other ethnic groups. Staff and patients seemed to differ on what 'compliance' meant. Staff appeared to see compliance as how well the patients followed the treatment instructions. Patients were concerned about their thought content (i.e. positive or negative thinking) and their ability to act or decide for themselves. Hierarchical regression analysis showed that negative thought patterns and problem focused coping were significant predictors of patients' compliance ratings, while negative thought patterns and depression were significant predictors of staff's compliance ratings. The findings were discussed in terms of risk factors for lack of compliance and psychosocial treatment options for diabetes patients.

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I continue to be struck by how much we learn when we listen.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER 1

INTRODUCTION

Background of the study

Diabetes Millitus has been identified as a major health concern amongst the people of New Zealand. This concern appears to be more critical when looking at the number of people with this condition accessing services in the Northland area. There are many potential complications from this disease, such as renal failure, neuropathy and cardiovascular conditions (Rachmani, Levi, Slavachevski, Avin & Ravid, 2002; Giacomozzi et al., 2002). The implication is that consumers not only need to access specialist diabetes practitioners, but also other departments of health provision.

Research in the psychiatric arena has found that people suffering from diabetes can exhibit a number of problems. Authors such as Trief, Britton, Wade and Weinstock (2002) have reported on how this condition adversely affects marital relations. Such findings become even more important in the light of evidence that erectile dysfunction is a particular risk factor for men above 50 years of age with diabetes (Bacon et al., 2002). In addition, the research found that when a lack of marital support and intimacy are perceived within the partnership, this further serves as a predictor to the quality of life being experienced. Quality of life in turn has been found to correlate positively with glycaemic control. Viner, McGrath and Trudinger (1996) reported on how the high levels of general family stress found amongst the diabetes population are associated with poor glycated haemoglobin control.

Much research has been published on the presence and pervasive impact of depression on glycaemic control. Adults and adolescents alike have been studied in

this regard. It is found that depression affects aspects such as perception of quality of life, burden of illness and motivation to such an extent that it has been suggested that provision for treatment of this affective disorder should be included in the standard treatment received. Lloyd, Dyert and Barnett (2000) found depression prevalence rates of around 28% in a UK diabetes sample. A link between depression and glycaemic control was found particularly in males. This research concluded that a significant proportion of the sample required psychological input, which was thought to improve glycaemic control and in so doing, overall wellbeing. Karlson and Agardh (1997) reported that the degree of depression present did not in fact appear to be related to the severity of the diabetes, but rather to the burden of living with the disease.

Another area of research focuses on the co-morbidity of eating disorders and diabetes. As insulin impacts on weight control, adolescent especially, manipulate their intake in an attempt to influence their weight more favourably (Willey, Kidd, Harris, Xu & Yue, 1995). In contrast, obesity has also proven to be a challenge for diabetic patients (Wing, 1993). Weight control treatments might include education and instructions on eating habits, dietary intake and exercise. Research indicated that few, if any, of these treatment areas are in fact successful in addressing weight issues as patients are non-compliant (Neumark-Sztainer et al., 2002).

The concern of non-compliance is a theme that is present throughout diabetes treatment literature. Not only does this pose considerable difficulties for the attending clinicians, but poor diabetes management could also results in a variety of, often severe, health consequences for the patients.

Statement of the problem

According to information provided by the Ministry of Health, it has been estimated that in 1996 nearly 5 000 adults were newly diagnosed with Diabetes. At that stage, about 18 000 individuals were diagnosed and 1 500 deaths were attributed to this disease. Differences are found amongst ethnic cultures. Maori and Pacific people are identified as being at least three times more vulnerable to the development of diabetes, and these groups are also more than five times as likely to die from this disease than New Zealand Europeans (Ministry of Health, models and forecasts, 1998). In addition, this publication projected that by 2011 the number of new diagnosis made will be more than double the current figure. People living with diabetes are likely to exceed 145 000. Such figures provide an indication of the scope and severity of the problem in New Zealand, which has been compared to similar figures in Third World countries.

At this time, the focus appears to be around education and provision of services for already diagnosed and potential diabetes sufferers. Extensive research has been conducted on the effects of specific variables or risk factors in living with diabetes, but little empirical research investigates the psychological phenomenon of compliance prediction and association within a particular geographical area.

In this research it was predicted that the presence of negative thought processes, specific styles of coping (i.e. avoidance and blaming) and high levels of depression would be associated with low compliance. In addition, it was also envisioned that staff and patients would differ in how they each rated treatment outcomes on a compliance rating form. Socio-demographic, background and physical risk factors were also examined to review their relationship with regards to the compliance indicators.

Review of related literature

The review of literature will first look at an overview of diabetes, covering epidemiology, diagnostic features and associated health risks. Secondly, some etiological features will be identified such as biological and psychosocial variables. Thirdly, current treatment considerations are reviewed. Lastly, information regarding compliance variables, as they relate to diabetes treatment, are discussed.

Overview of Diabetes

Description of illness: Surwit and Schneider (1993) describe Diabetes Millitus (DM) as a group of disorders that relate to a defective carbohydrate metabolism system. An abundance of glucose is present in the blood due to the fact that the pancreas secretes insufficient insulin to absorb it. DM can be classified into various types; which Bradley et al., (2001) describe as follows:

Table 1

Classification of diabetes mellitus

Type	Description
1	Insulin dependent diabetes (IDDM)
2	Non-insulin dependent diabetes (NIDDM)
	a Non- obese
	b Obese
3	Malnutrition-related disorders
4	Other types, associated with conditions and syndromes such as pancreatic disease, drug or chemically induced conditions, diseases of hormonal aetiology
5	Gastational diabetes

As the above authors indicate that IDDM and NIDDM are the most common forms of diabetes, the scope of this research will focus on these two types.

Type 1 would mean an auto-immune reaction is produced against beta cells. These cells produce insulin in the Islets of Langerhans in the pancreas. Insulin functions to allow glucose absorption into the tissues (other than in the brain). When insulin is not being produced sufficiently to absorb glucose, the body has to use protein and fat to produce energy. People loose weight, as their bodies are being starved. Type 1 diabetes are insulin dependent individuals (IDDM).

In Type 2 diabetes, the body can be either insulin resistant, i.e. the insulin receptors are not allowing the insulin to absorb blood glucose; or the pancreas does not secrete enough insulin for the amount of blood glucose present. Unlike Type 1 diabetes, Type 2 is often developed slowly and people can go undiagnosed for years. Type 2 is also referred to as non-insulin dependency (NIDDM). Healthy blood glucose levels fall within a range of 4-8 mmol/L.

If the pancreas is damaged due to for example, severe and chronic pancreatis (inflamed pancreas), tumours or hemochromatosis (over absorption of iron), it cannot produce insulin. In gestational diabetes, the hormones secreted by the placenta can counteract insulin. The body will attempt to excrete excess blood sugar in the urine causing glycosuria, but this does not serve as sufficient evidence of diabetes.

Hyperglycaemia means that the person's blood sugar levels have risen above the accepted normal range for that person, usually above 8 mmol/L. They may present with symptoms such as increased thirst and susceptibility to infections (see Figure 1).

In cases of prolonged hyperglysaemia, ketoacidosis (blood becomes too acidic due to presence of waste product ketones) can occur. Symptoms become more severe including fruity smell on breath, vomiting, stomach pains and shortness of breath (Diabetes New Zealand, 2000). Mild hyperglycaemia over a prolonged period can cause eye, kidney, heart and foot damage.

Hypoglycaemia is usually found in a person with below 4 mmol/L blood glucose levels. Irregular meals, low carbohydrate intake, too much insulin and drinking alcohol without food can cause this. Adrenaline is then released into the body and can cause the patient to experience symptoms such as blurred vision and hart palpitations (see Figure 1). This condition does not occur in people who are not on diabetes medication or when the tablet used is Metformin. Figure 1 illustrates the concepts of hyper and hypo-glycaemia.

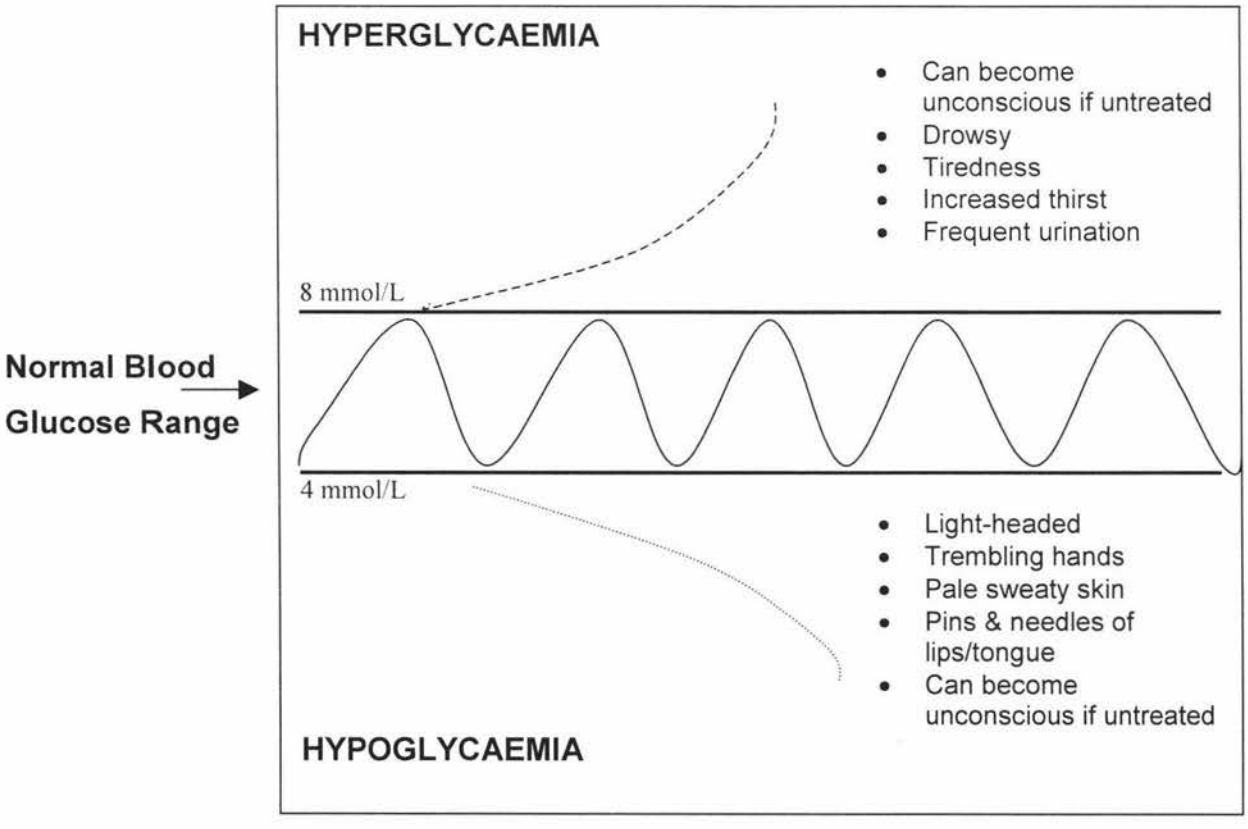

Figure 1. Blood glucose range

From "It's time to shed some light on Diabetes", by Diabetes New Zealand Society, 2000, p.11. Adapted with permission of the society.

Diagnostic issues: Saudek, Rubin, Shump et.al., (1997) refer to the blood sugar diagnostic criteria for non pregnant adults as being; (a) random plasma glucose greater or equal to 200 mg/dl with hyperglycaemia symptoms of thirst, excessive urination and weight loss or, (b) fasting plasma glucose greater than or equal to 126 mg/dl as least twice or, (c) 75 gram oral glucose tolerance test tow hour plasma glucose greater than or equal to 200 mg/dl.

Some individuals have stable diabetes, i.e. their blood sugar levels remain high with little fluctuation; whereas with unstable diabetes the levels are often higher than normal but fluctuate rapidly. Type 1 diabetes manifests with the presence of antibodies to a variety of islet proteins. As the antibodies often appear years before symptoms and is not present in Type 2, they can be used to distinguish between types of diabetes and predict potential onset of Type1. The clinical symptoms of IDDM tend to be more acute and thus more likely to result in coming to the physician's attention and be diagnosed. Type 2 diabetes is, according to the above authors, more common than Type 1.

Peak incidence of the disease is around early adolescence, decreasing after 13 years of age, with a small excess in the male population. Reportedly, a marked seasonal variation exists with diagnosis mostly been made in autumn or winter. As yet, there is no known way to prevent diabetes in identified high-risk people or to cure it.

Common diagnostic errors made are described by Watkins, Drury & Howell (1996) as consisting of; (a) physicians starting diabetes treatment on the basis of glycosuria (glucose in the urine): (b) diagnosis of diabetes using only blood glucose strips: (c) performing a blood glucose tolerance test when good blood glucose levels are present.

Adriaanse, Snoek, Dekker, Van der Ploeg and Heine (2002) in the Netherlands researched the impact of receiving a diagnosis. They found that individuals participating in a screening program and subsequently newly diagnosed, reported a limited understanding of their condition. This is despite been educated and given additional information on the subject. Paradoxically, while having apparent little understanding, the study further found that such newly diagnosed individuals were not alarmed by having the condition and that their families and loved ones were also not overly concerned. This research therefore postulated that the psychological impact of screening and being diagnosed as having diabetes, was limited. Jacobson (1996) indicated that those individuals with poor glycaemic control were particularly vulnerable to the development of severe complications, hence educating this group of the potential effects would be indicated. Beeney, Bakry and Dunn (1996) however found that GP's often overestimated complications as a concern for the newly diagnosed patients. Rather, these patients often had questions regarding injections and wanted to be given options regarding treatment and participation in decision making.

Etiology of diabetes

Biological risk factors: A tendency to develop Type 1 diabetes may be genetically inherited, especially with a family history of hyperglycaemia. However, authors Surwit and Schneider, (1993) cautioned against such conclusions due to the role of environmental factors. In this regard, stress and its effect on metabolic control was identified as a contributing factor.

Authors Hales and Barker (1992) postulated a biological aetiology of diabetes. These authors indicated that the pancreas of malnourished babies during pregnancy would have a decreased ability to cope with excess calories later in life. This in turn would lead to the child becoming overweight.

Authors Watkins, Drury and Howell (1996) explored genetic and environmental contributing factors. Identical twins with NIDDM have reportedly almost 100% concordance. In the UK, approximately 15% of IDDM have a first degree relative affected by diabetes. The risk of developing this condition will increase by about 6% if the affected parent is the father. The highest incidence of diabetes is in Scandinavia and the lowest in Japan. These authors comment on the 'striking increase' of diabetes as one moves further from the equator. They explored the increase of diabetes when Japanese children (low risk area) moved to Hawaii (high risk area). They concluded that even short term, environmental factors played a significant role in the onset of this disease. A 30-fold increase of IDDM and a 20-fold increase of NIDDM between high and low risk areas were reported.

Body-weight as risk factor: The Ministry of Health (models and forecasts, 1998) concluded that obesity accounts for almost a third of the diabetes increase rates in New Zealand. With this in mind, it was recommended that nutritional

education and greater levels of physical activity, would help to decrease the prevalence rates. Body Mass Index is calculated by dividing height squared with weight in kilograms. Being overweight results in the body being resistant to insulin, especially in people over 40 years.

Watkins, Drury & Howell (1996) reported that approximately 60% of newly presenting diabetic patients would be obese (above 120% their ideal body weight). It is reported that if a person is 25% overweight, they have a three-fold increased risk of developing diabetes compared to normal-weight people. With a 50% overweight ratio, the person becomes 12 times more likely to develop diabetes.

Coping ability as risk factor: Ruggiero et al., (1997) found in their research conducted in Rhode Island that most individuals who were insulin dependent tended to be young and single, while non insulin dependent patients were more often divorced and/or separated or widowed. Insulin dependent individuals were also more likely to be employed with some form of tertiary education. Marital status, education and employment were concluded to be variables related to the type of diabetes suffered.

Surwit and Schneider (1993) looked at the role of coping with stress as a aetiology factor of diabetes. Working from the standpoint that stress affects metabolic activity and that diabetes is characterised by a lack of insulin, then the increase in blood glucose levels due to stress will be poorly metabolised in this population group. They hypothesised that stress was therefore a contributor to chronic hyperglycaemia in these patients. The role of this connection is unclear as they found that stress in animal studies did not precipitate Type 1 diabetes, but rather Type 2 diabetes. In human studies results varied indicating that stress could result in

hyper-, hypo- or no effect on glycaemic levels. In connecting these findings to treatment considerations, they postulated pharmacological and behavioural interventions could help control levels of stress experienced.

Other research has focused on whether a relationship between personality and glycaemic levels existed, which authors Mazze, Lucido and Shamoon (1984) rejected as a hypothesis. They used a personality questionnaire (EPI), which indicated no differences between the sample subjects at entry of the research or during the research once participants had been assigned to conventional or intensive treatment options.

Depression as risk factor: Peyrot and Rubin (1999) concluded that the onset of diabetes could trigger symptoms of depression due to either psychological (stress) or biological processes. Depression however, could also increase the individual's vulnerability to develop medical conditions, which include diabetes.

Lustman, De Groot et al., (2000) reported an association between depression and hyperglycaemia, but indicated more research was needed to study the direction of this influence. They concluded that depression was a potentially significant risk factor for individuals vulnerable to develop diabetes as depression adversely effected lifestyle conditions. Talbot and Nouwen (2000) hypothesised that the high levels of depression in diabetes patients, were the result of biochemical changes directly due to the diabetes (Type 2) and/or the psychosocial demands the illness and it's treatment posed to the individual. Psychosocial demands related specifically to the intrusiveness of the chronic illness, perceived ability to cope and levels of social support. This hypothesis was not supported by the research findings. They did however report that the 'multi-determined' interaction of biological and psychosocial

factors may increase the probability of generally healthy individuals developing Type 2 diabetes. Authors such as Kovacs, Goldston, Obrosky and Drash (1997) reported on the importance of monitoring diabetic individuals' mental health conditions as depression is often untreated in primary health care settings.

Thought process as risk factor: While much research has focused on the relationship between depression and diabetes, the role of the patient's thought processes as a risk factor in the development of diabetes have, in contrast, received little attention. Hollon and Kendall (1980) found that symptoms of depression were positively correlated to the presence of negative thoughts. While there is insufficient evidence from the literature review to draw conclusions regarding the role of thought processes per se, given the correlation between depression and negative thoughts, they may elude to similar findings. Research on thought processes appears to be more focused on the role of cognitive therapies in patient management. These findings will be discussed under compliance considerations.

Treatment considerations

Medication: The UK Prospective Diabetes Study Group (1998) reported on the potential use of glucose control with metformin as opposed to insulin as it was found that insulin resulted in higher weight gain and more hypoglycaemic episodes. In exploring how to reduce microvascular and neurologic complications in IDDM, research conducted by the Diabetes Control and Complications Trial Research Group, Massachusetts (1993) found that intensive therapy, consisting of frequent glucose monitoring and at least three daily insulin injections, reduced the risk of retinopathy development by 76%. The adverse effect associated with intensive

therapy however, was a twofold increase in the likelihood of hypoglycaemia developing.

Pharmacological studies have compared compliance to treatment when given one tablet per day versus more than one. Adherence decreased with each increase in medication and complexity of treatment prescribed. While it therefore can be argued that less medication is likely to increase compliance, in practical terms, this does not assist individuals already on complicated treatment regimes.

Clinics tend to rely on blood glucose testing (Donnan, MacDonald & Morrist; 2002) to formulate a treatment plan, draw conclusions regarding progress as well as assess compliance with the suggested treatment regime. IDDM can be managed through a combination of using the insulin injection, managing carbohydrate intake and increasing exercise and general energy levels. The goal of this is to maintain the blood glucose levels within the normal range. The implication is that IDDM patients often have to monitor their levels several times daily. Bradley, Riazi, Barendse, Pierce and Hendrieckx (2001) reported that during the 1980's and early 1990's twice daily injections were the consensus. Currently more intensive therapy has been positively associated with reduced risk of chronic complications, and up to five injections per day is recommended. The compliance implication for a needle phobic patient would be severe.

The above authors also looked at the use of oral hypoglycaemic medications for NIDDM. Oral medication is reportedly added to the treatment regime only after efforts to control hyperglycaemia with diet, have proven unsuccessful. The aim of the drug is to stimulate the production of endogenous insulin or enhance the effectiveness of the existing levels of insulin. A variety of oral medications are available, differing in their focus and potential side effects. Should adequate blood

glucose levels still not be achieved, insulin is likely to be added as part of the treatment. This however means that NIDDM patients then become as vulnerable to developing hypoglycaemia as the IDDM group.

General health: The patient does not only have to deal with their physical condition, but complications of poorly managed diabetes are numerous and often severe. Complications can be responsible for considerable morbidity and mortality. Rachmani et al., (2002) reported that diabetes patients have a shorter life expectancy than non-sufferers. In addition, they also have a higher incidence of cardiac and peripheral vascular disease. Authors such as Morris et al., (1997) described how intensive insulin treatment helps combat the development of microvascular complications. Little evidence is however present to indicate that such complications would not eventuate over time regardless of best efforts.

Research on foot ulceration completed by Giamozzi, Caselli, Macellari et al., (2002) found that diabetic people with peripheral neuropathy developed a different walking strategy, and that this change resulted in foot ulcers. The researchers found that the walking strategy shifts from the ankle to the hip, which causes an alternative foot-to-floor interaction as well as different foot loading or centre of pressure. When the centre of pressure moves towards the medial part of the foot, these patients may experience a lack of foot control as they fail to use their heel to the same extent found in a natural walking action. In patients without neuropathy, changes in gait were also noted. This was attributed to a reported stiffness of the ankle joint, which also resulted in changes of the centre of pressure. Hence, diabetic patients are at risk of developing foot ulcers as well as sore and stiff ankle and hip joints due to the altered gait.

Anderson, Clouse, Freedland, Freedland and Lustman, (2001) reported on other health considerations including erectile problems, loss of sexual desire with non insulin dependent women, coronary artery disease and kidney dysfunction. Rubin and Peyrot (1992) reported on the fluctuations and partial visual acuity loss sometimes present as a side effect, as being similar in impact to that of blindness.

Neuro-psychology findings: Strachan, Dreary, Ewing and Frier, (2002) reported that there was insufficient evidence to suggest explicit areas of cognitive deficit among diabetic versus non-diabetic population groups. Such research has been criticised for not taking into account other factors that may impact cognitive functioning such as the use of alcohol and drugs, pre-morbid intelligence, co-morbid mental health problems such as depression, and medical conditions like hypertension. In an attempt to address these research shortcomings, authors Asimakopoulou, Hamson and Morrisht (2002) explored neuro-psychological functioning amongst Type 2 diabetic patients. Overall, no differences were found in cognitive abilities. Their results indicated small, but not statistically significant differences in the specific areas of mental flexibility and verbal memory. These findings were applicable to what was described as uncomplicated Type 2 diabetes sufferers. It was hypothesised that, with co-morbid complications, this effect may be more pronounced.

Group interventions: In therapeutic group sessions the focus is on dealing with daily coping difficulties and strategies rather than psychiatric or psychological conditions such as anxiety or depression. The results of such interventions appear to target issues of motivation and secondly, to allow patients expression of their

frustrations. Authors Anderson, Arnold, et al., (1995) found greater levels of perceived well being and greater social functioning for those attending group programmes. They concluded that enhanced coping abilities positively effected glycaemic control and recommended that in an ideal setting interventions should be equally distributed between blood glucose management and those treatments focussed on empowering and enhancing the patient's coping abilities and their mood.

Diabetes youth camps, according to Rubin and Peyrot (1992), resulted in mostly only short term treatment compliance. One possible reason for this result is argued to be around the fact that camps typically are organised with a particular goal in mind, for example weight control. Patients are then taught to be problem focused on a single treatment variable. When they return to their normal environments, the multiple effects of living with diabetes soon overwhelm them.

Empowerment framework: Motivation and poor adherence problems occur due to the patient realising that the obstacles they have to face, outweigh the possible benefits of good self-care. This is the primary source of treatment problems in dealing with diabetes patients, as postulated at the Psychosocial Aspects of Diabetes Care workshop in Auckland, March 2003. A number of obstacles are identified, such as mood disorders, harmful beliefs about diabetes such as hopelessness, unclear or unrealistic self-care plans, environmental factors such as financial stress, cultural influences and poor social support for change.

An evaluation of what these barriers for each patient are, is suggested. The hypothesis is that in understanding the barriers as well as the accompanying emotional content, the patient can be helped towards identifying what they choose and feel able to change. This helps the patient to deal with their goals in a problem

focused manner. The health care professional is thus primarily in a support role, i.e. helping the patient clarify their needs while 'tapping into' those aspects they are motivated to change. From this perspective, self-care barriers are the reason for poor compliance and not ignorance of the disease or management strategies.

Authors Norris, Engelgau and Narayan (2001) reviewed the effectiveness of self-management. These authors concluded that interventions needed regular reinforcement to have longer-term glycaemic control effects. Short-term self-management for Type 2 diabetes patients was, however effective. Rubin and Peyrot (1992) reported that patient empowerment programmes have been found to be an effective tool in terms of patient education with evidence of long term improved glycaemic control.

Compliance considerations

Compliance has been described by Bradley et al., (2001) as the extent to which the person's behaviour reflects or coincides with the health advice given. Inadequate or poor compliance to suggested treatment is then, by implication, perhaps the most important obstacle to successful outcomes. The definition excludes the possibility that the advice given by the professional was inadequate for controlling that particular person's condition. There is often a tendency to take credit for success, but blame the patient for perceived failure. These authors hypothesised that health professionals were very likely to 'suffer' from such patterns of behaviour. Information presented at the psychosocial Aspects of Diabetes Care workshop (2003) indicated that physicians perceived poor compliance resulting from either lack of patient self-discipline (53.2% of time) or poor will power (50%). It is also interesting to note that 36.9% of the time physicians felt patients were not scared

enough to make the necessary changes their disease required. Such perceptions will significantly impact how health care professionals approach and deal with compliance issues. Sarafino (1998) reported on the tendency of patients and practitioners to be in disagreement with regards to compliance outcomes. Patients tended to overrate their compliance as perhaps they answered according to what they believed was expected from them. In turn, according to the author, the practitioners often did not know to what extent their patients adhered to suggested treatments.

The theme of compliance is one that demands much attention in the literature. However as Heller (2002) points out, vast amounts of money are spent on the screening and treatment of diabetes, but relatively little is known about which interventions result in better biomedical or psychological outcomes. With diabetes patients, the dilemma of compliance lies in the patient's realisation that compliance will not result in the lack of, or cure of the condition. The treatment regime is likely to be complex, life long and require the patient to make many behavioural changes.

Motivational interviewing: Doherty and Roberts (2002) make a case for this strategy in order to enhance compliance with diabetes treatment. They note that patients can demonstrate non-compliance by arguing, interrupting or ignoring the practitioner or denying and minimising the extent of their problems. With a motivational interview framework, non-compliance is viewed as a changeable characteristic of the individual and not a personality trait. An element of psycho-education is suggested whereby the practitioner discusses with the patient a model of change and relapse so that specific actions to challenge each phase can be implemented. The drawback of this framework lies in the fact that the individual may choose behaviours they find problematic, but their identified behaviours may

not correspond with the practitioners' treatment goals. Therefore, while such goals may be reached, they do not imply greater compliance outcomes or better health.

Self-management: The role of self-management has been explored as a method of enhancing patient compliance. Programmes found that patients most often managed their medication regime while they were least likely to manage life style, diet and exercise recommendations. Self-monitoring programmes were found to work best when patients were provided with treatment options, but continued to receive regular follow up by their practitioners (Ruggiero et al., 1997; Norris, et al., 2002). In much the same trend, research on the effects of diabetes registries on reminding and following up with patients, have reported favourable responses. Such registries help keep track of which patients require consultations or testing. The effect was however found to be modest i.e. keeping track of procedures did not necessarily equate to adequate interventions taking place. Authors such as Stroebel et al., (2002) postulated that a registry system needed to be complimented with a diverse and extensive range of other available interventions, including psychological assistance.

Demographic variables: Research conducted by Ruggiero et al., (1997) found differences in coping and management of diabetics across demographic variables. Their findings suggested self-management abilities improved with age as related to diet and glucose testing behaviours. Employed people were found to be less likely to comply in these areas. On self report questionnaires, IDDM patients reported that only 76% of them received dietary treatment instructions while 59% of the sample were given exercise instructions. Their perceptions of not having received

the treatment instructions in the first place, would adversely affect compliance outcomes ratings. Sarafino (1998) reviewed the impact of demographic variables such as age, gender and ethnic identity on compliance outcomes and concluded there was a lack of evidence supporting associative considerations. However, the relationship of these factors may be more complex depending on circumstances such as the nature and duration of the disease, patient and practitioner relationship, patient expectations of treatment benefit etc.

Because limited research focuses on the relationship between demographic variables and compliance outcomes, research from other areas was considered. Hildebrandt, Steyerberg, Stage, Passchier and Kragh-Soerensen (2003) evaluated gender differences in responding to anti-depressant medication. They found no gender differences in remission or drop out rates and both genders had similar post-treatment depression ratings. They concluded that overall, differentiating treatment outcomes according to gender was not feasible. Such findings are also reflected in studies of rheumatoid arthritis (Viller et al., 1999). Research by Mancuso, Rincon, McCulloch and Charlson (2001) used a hierarchical regression to predict that being Hispanic or black was more likely to result in experiences of poorly managed asthma. They concluded that these minority groups were at greater risk for poor compliance outcomes. Their research included findings that the expectancy to be cured from the disease was also related to poor outcomes.

Coping variables: Snoek and Skinner (2002) investigated the use of psychological support in treating the multiple problems diabetics face, such as depression, eating disorders, anxiety, self-destructive behaviour and interpersonal conflicts. These researchers found that while Cognitive Behaviour Therapy (CBT)

was an effective intervention of depression treatment in Type 2 diabetics, little evidence was found that counselling for complex cases resulted in long term improvement. Favourable results were reported in other areas such as stress management and eating disorders. Behavioural family therapy was not found to impact significantly on glycaemic control, although reportedly it helped families to resolve conflict.

The stress management framework implies that people with greater coping abilities would have improved metabolic control as they maintain better self-care regimes. The second component of this framework is that the presence of stress per se, negatively effects blood glucose levels. Stress effects metabolic conditions in the following manner (Bradley et al., 2001): (a) psycho-physiological effect. This results from sympathetic and pituitary activity which causes changes in hormonal levels. In diabetics this could result in increased blood glucose levels: (b) behavioural component during which monitoring and self-care may be compromised. For example, rushing to meet work deadlines results in less regular and diabetically 'balanced' meals or blood monitoring. The link between diabetes and stress may be a two-way connection whereby life events disrupt care and control, which in turn can increase the number and severity of the life events being experienced. Authors Lane, Feinglos, McCaskill, Surwit and Ross (1993) examined the use of relaxation training in NIDDM individuals. They found that incorporating such training and exercises appeared to have little effect on blood-glucose levels compared with a control group. Aspects such as personality, tendencies towards being worry-some and perceived locus of control were more significant indicators of changes in glucose levels.

Mendez and Belendez (1997) suggested that a number of skills training strategies, including coping abilities, needed to be incorporated in the overall

treatment regime of the diabetic. As these authors view treatment compliance as a behavioural variable, they postulated that greater anxiety management would result in behaviour consistent with suggested treatments. Their research, while focussing on adolescents, indicated a positive connection between helping individuals to cope with their disease and stable blood glucose levels. Behavioural strategies focused on aspects such as problem solving techniques, contracting needed behaviour, social skills and relaxation exercises. The study also consisted of participants with primarily good glycaemic control. Hampson et al., (2000) reported in their study of Type 1 adolescent diabetes sufferers that for behavioural programmes to be truly effective they would need to routinely be included in treatment services offered. This research may not be applicable to an adult sample.

Adult focus research was completed by Lorenz et al., (1996). These researchers found that intensive behavioural programmes were successful in attaining long term positive glucose control. They pointed to the importance of having negotiated treatment goals and individual treatment plans. A. M. Nezu, C. M. Nezu, Felgoise, McClure and Houts (2003) reported on the positive effects of problem solving therapy. In their sample of adult cancer patients, improvements in problem solving were correlated significantly to improvements in psychological distress measures as well as overall perceived quality of life. These findings were supported by Kobau and DiIorio (2003) who found that epileptic individuals managed their medication regimes more effectively than suggestions related to changes in life-style. Those with low treatment expectancies and poor self-management abilities were also more likely to experience perceived negative disease management. Authors Stewart et al., (2003) evaluated the symptoms of emotional distress and coping abilities on glycaemic control with Hong Kong youths aged 10 to

23 years. They found that self-regulatory behaviour had a significant impact on glucose levels. Following 'fixed' instructions from practitioners remained important but the research emphasised that adherence outcomes were more complex that this.

Kutz (2000) evaluated the impact of coping styles and patient satisfaction of care in a Type 2 diabetic sample. Findings indicated that patients who enjoyed a positive patient-practitioner relationship, were more inclined to adhere to treatment. When patients used avoidance as a coping strategy, this adversely affected their compliance outcomes. The coping method or style used, was related to the adherence of the prescribed treatment regimes. Christensen and Ehlers (2002) evaluated end-stage renal failure patients with regards to coping style. Findings suggested that compliance with treatment was enhanced when the patient's choice of coping style was in line with the demands of the medical situation i.e. problem focused and accommodating changes in life style.

Depression variables: Rubin and Peyrot (1992) identified a multiple range of problems that could affect the compliance of patients. These include psychological sequelae of being in a physical crisis, daily stress and inconveniences of living with diabetes as well as family stress and dysfunction. This lead to the proposal that diabetic individuals are especially vulnerable to the development of poor physical and emotional well being. It is possible to envision a cyclic situation occurring; the individual who feels stressed or depressed is not motivated to comply with medication only to have their overall condition and wellbeing decline, which in turn makes them more depressed. Ciechanowski, Katon and Russo (2000) reported depressive symptoms resulted in poorer compliance to diet and medication treatment as well as functional impairments and higher health costs.

Lustman, Clouse, Griffth, Carney and Freedland (1997) reported that without therapeutic interventions, depression becomes a chronic condition in the diabetes population. These authors pointed to the erroneous conclusion that depression in medically ill people, is a secondary consideration to their physical condition. Keller, Hirschfeld, Demyttenaere and Baldwin (2002) reported that compliance with antidepressants was poor in chronic and recurring depressed patients. They proposed that the education of both the patient and the practitioner regarding the impact of the medication was needed to increase compliance. The more realistic the patient and practitioner's expectations, the greater the treatment adherence would be. However, they acknowledged that poor medication tolerance would considerably influence the likelihood of such medication been taken long term. In evaluating the relationship of depression on medical outcomes of diabetes, Lustman and Clouse (2002) concluded that depression was associated with accelerated incidences of heart diseases. Practitioners and researchers have found that most clinics seem to be at a loss regarding multiple intervention aims in an integrated treatment regime to facilitate positive outcomes over a longer term. These authors stated that interventions aimed at improving depression as well as diabetic illnesses are still being sought.

Thought process: Such research was completed in Michigan by Becker and Janz (1985) and referred to as the health belief model. This model looked at the value the person places on a goal and the belief that treatment compliance will likely result in that goal been achieved. Thus, if a diabetic aims to be cured or the disease be prevented, then according to this model, they are unlikely to adhere to treatment as the goal cannot be reached. Negative thoughts about themselves, the disease and their future options, can then occur. If they however chose as a goal to maintain

healthy eating habits while suffering from diabetes, this goal could be reached and then patients are more likely to adhere to suggestions. The authors found that 80% of their sample did not administer their insulin in an adequate manner and 45% used their self-monitored test results in a way that was likely to be detrimental to their condition. Psycho-education was believed to be a big part of this model in that the practitioner and the patient worked together to identify the patient's beliefs, perceived benefits, risks and barriers to treatment. Critics note that while this model serves as a theoretical framework for identifying patients' beliefs and attitudes, it does not imply a particular strategy for change.

Patient expectations were studied by Meyer et al., (2002) who reported that patients expecting the treatment to be beneficial were more inclined to be constructively engaged in the session, which contributed to symptomatic relief in this depressive sample. The role of positive expectations on outcome was supported by Cormier' (2002) study with chemically dependent women who found that the lack of confidence in their own abilities to abstain from drugs, was a predictor of post-treatment relapse.

Jensen, Turner and Romano (2001) evaluated the association between thoughts and coping in pain treatment. They found that thought processes focused on catastrophizing lead to decreased coping abilities and increased depression ratings. When patients viewed themselves as having a 'real' disease or condition, they were less likely to rate themselves high on disability self-ratings. Increased perceptions of locus of control were favourably associated with pain management. In research focused on depression treatment, Hodgson (2000) found that negative thoughts or cognition were adversely related to the patients' treatment response. Specifically, negative views of the world and the future resulted in poor treatment outcomes. The

researcher hypothesised that this may be due to an external locus of control as the patients perceived little ability to control or predict events in the world. When patients perceived the problem as being internal and therefore potentially changeable (i.e. negative thoughts about the self), they were more likely to comply with medication.

Conceptual framework of the study

For this study, the conceptual framework proposed is an integration of the various aspects identified and discussed as relating to the literature on compliance. In addition to these elements, the framework also proposes to explore the similarity or difference between staff versus patients' perception regarding their level of compliance, (see Figure 2). This framework was developed to explore the interrelationship of these factors on treatment compliance of diabetics. The components are organised in two main categories i.e. demographic and psychosocial variables. The demographic variables focus on age, socio-economic status and past/present complications. The psychosocial variables consist of perceived levels of depression, presence of negative thought processes and coping styles. It is envisioned that the psychosocial and demographic factors will predispose the individual to experiencing problems in adhering to suggested treatment regimes.

In the course of this study, compliance is referred to as the extent to which the patient's behaviour coincides with the advice and treatment regime given by the health professional. The scope of the professional 'advice' will include factors such as regular testing of glucose levels, taking of medication, changes in diet, following an exercise plan and regular attendance of consultations.

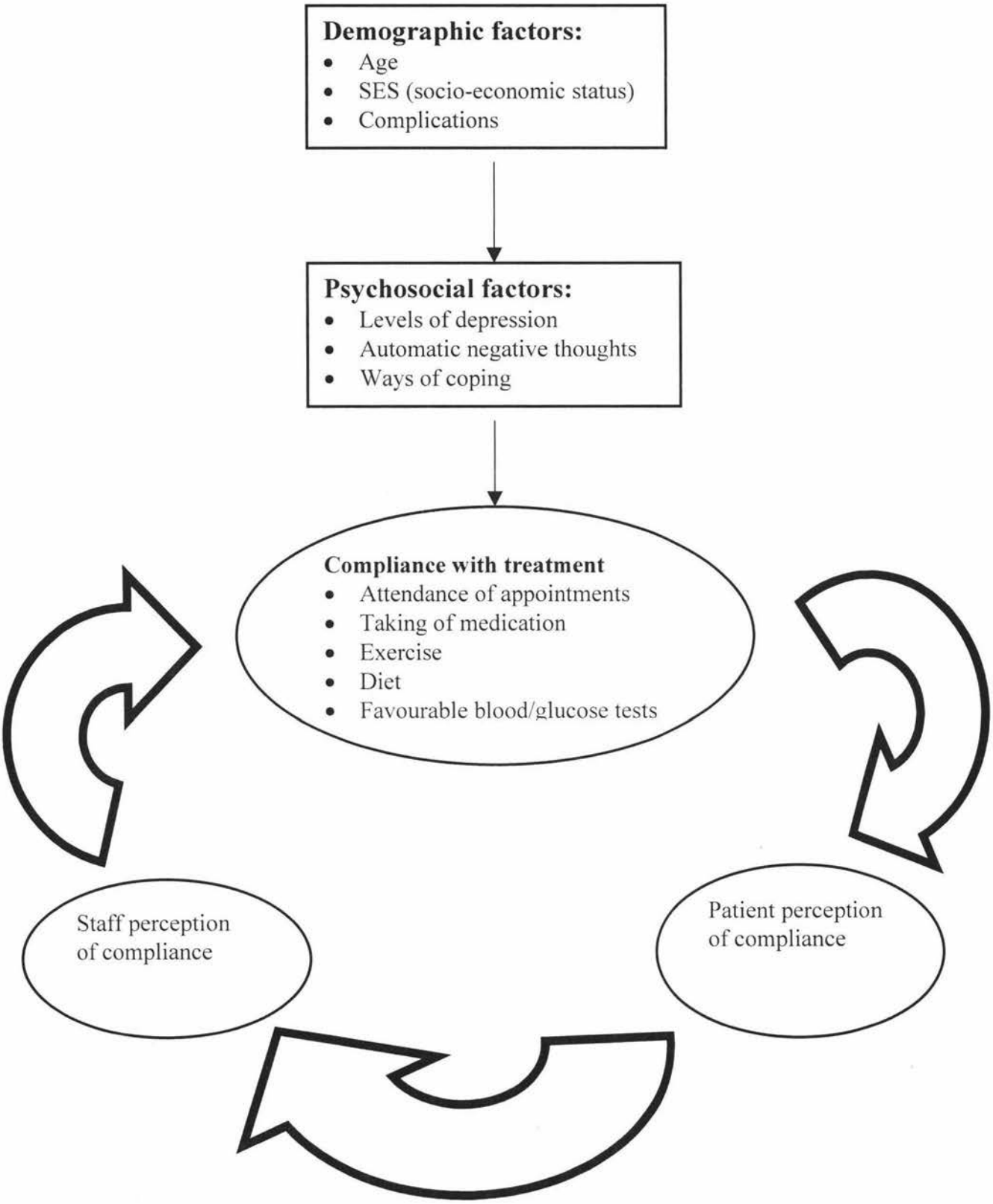

Figure 2. Conceptual framework of the study

Summary and hypothesis

In reviewing the related literature, research suggests that certain relationships exist between demographic and psychosocial aspects and compliance outcomes. The literature indicates few if any gender differences related to compliance ratings or treatment outcomes. There is a lack of literature reporting on differences in Maori versus NZ Pakeha/European diabetes compliance ratings, however literature from other medical areas suggest there may be ethnic vulnerabilities in compliance outcomes as they relate to minority groups. Research also suggests that older people are more inclined to adhere to their treatment regimes. Little research on socio-economic status per se is present beyond suggestions that individuals working full-time are less inclined to comply with especially complex treatment instructions.

Most research focused on psychological aspects of coping abilities and the presence of depression as they relate to treatment outcomes. Different coping styles are associated with perceived life and treatment satisfaction, which in turn affects compliance. Patients who felt they had a choice in their coping manner, were also more likely to adhere to suggested treatments. Perhaps the strongest association is between depression and compliance literature. Researchers and practitioners appear clear that in order to achieve greater levels of compliance, depressive symptoms have to be targeted as part of the overall treatment regime (Gavard, Lustman & Clouse, 1993). A trend reflecting this knowledge may have resulted in psychologists increasingly forming part of the multidiscipline treatment teams (Snoek & Skinner, 2002).

Cognitive processes is an area that appears to have received less attention in the literature. CBT as a treatment method is evaluated, especially with regards to depressing in Type 2 diabetes. Research outside of the diabetes arena indicated that negative

thoughts, beliefs and expectations about the disease and treatment as well as perceived locus of control, impact on compliance outcomes.

The level of non-or- poor compliance is generally considered by staff to be an indication of the level the patient still needs to change and adapt to dealing with the disease. Differences between self and staff ratings of adherence, is reflected in the literature. Research acknowledges that these patients have multiple problems and potential complications to deal with, and that the adaptations the patients need to undergo are likely to be life-long. Current research is also abundantly clear that while more normal blood glucose levels (often a standard used to measure compliance) is attainable over a short term, there is little evidence that this can be maintained over time.

Presently, studies focussing on which of these factors may predict compliance are virtually non-existent. The implication of this is that practitioners and patients are likely to continue being frustrated with vast amounts of aetiology and treatment knowledge at their disposal but little indication of how this may be used to facilitate better outcomes. Therefore, based on the available information, the following hypothesis will be tested:

h1. No gender differences as related to depression, coping styles, presence of negative thoughts and compliance will be present.

h2. Maori are likely to be less compliant with staff treatment suggestions than NZ Pakeha/European.

h3. Age differences in compliance will be present with older patients rating higher on compliance than younger patients.

h4. Certain coping styles such as blaming and avoidance will have an inverse relationship with compliance outcomes while being problem focused will be associated with higher compliance.

h5. Depression will be negatively related to compliance, such that higher levels of perceived depression will be associated with lower levels of compliance.

h6. Negative thoughts will be inversely related to compliance, such that higher levels of negative thoughts will be associated with lower levels of compliance.

h7. Differences between self and staff compliance will be found in that the participants will rate their own compliance higher than the staff rate them.

The relative and unique contribution of negative thoughts, coping styles and depression on compliance will be examined.

Because there is a lack of literature information regarding compliance differences for certain demographic groups such as SES, marital status, knowledge of type of diabetes, adverse side effects and family history, the relation of these groups to the dependent variable will be evaluated in this study.

Significance of the study

Previous research has primarily focused on looking at compliance of diabetes patients by identifying isolated factors that may influence this. Such factors include coping styles and psychosocial risk factors (Skinner, John & Hampson, 2000). An extensive amount of research has also focused on the chronically ill adolescent or young children and how their families cope (Ireys, Chernoff, DeVet & Kim, 2001; Kyngas & Rissanen, 2001). Chernoff, List, et al., (2001) investigated the importance of positive thinking in coping with chronic illness, but their study was again limited to children.

With this research it is proposed to include and expand such identified compliance risk factors while examining what the effect of a combination of these factors might have on treatment compliance. The issue of compliance per se needs to be looked at, as treatment outcomes have far reaching consequences given the extent of the problem within New Zealand. Psychological aspects such as levels of depression, ways of coping and presence of automatic negative thought patterns will be included in the scope of the study. This research will in addition be specific to the Northland geographical region, with the adult population as its focus. This study will attempt to clarify the role that each of these variables play in determining compliance outcomes. Further it is envisioned that in the future, psychosocial interventions will need to have greater emphasis and impact if we are to attend efficiently to the growing number of diabetic sufferers.

CHAPTER II

METHOD

Research Design

This research used a survey design with a convenient sample of adult diabetes patients. Different demographic groups were compared on thought processes, depression, coping styles and compliance with treatment as perceived by the patients themselves and by their respective clinicians. The relationship among automatic negative thoughts, styles of coping, depression and compliance were examined. Hierarchical regression analysis was used to ascertain the unique contribution of each of the predictor variables on variance of both compliance scores.

Participants

During the course of the data gathering period, which spanned four months, a total of 114 subjects agreed to participate in this study. All participants were from the Diabetes Clinic, which is an outpatient treatment facility connected to the Northland District Health Board. It consists of a multidiscipline team, with a physician, nurse, psychologist and dietician. A variety of clinics are run from this centre, for example retinopathy screening, psychotherapy, diabetes education, diagnosis and monitoring of the condition.

The participants were recruited from the retinopathy clinic during one of their usual appointments. As all diabetes patients on the clinic's database are scheduled for appointments to attend for retinopathy screening, staff thought that this population would be the best group from which to obtain a sample. Not all diabetes patients see a psychologist or physician unless they present symptoms which require further

investigation. Only patients who had been diagnosed for diabetes for a minimum of six months prior to this study, were included because it was assumed that they would be better able to judge their own compliance as well as answer the questions that focused on their overall thoughts and coping styles associated with the diagnosis of diabetes.

Table 2 shows the demographic characteristics of this sample. The ages ranged from 28 to 88 years ($M = 59.2$, $SD = 14.9$). The majority of the sample were in the lower socio-economic bracket of $10-to $30 000 ($n = 64$, $SD = 1.9$). The greatest representation was Type 2 diabetes ($n = 64$), however, 48.2% ($n = 55$) of the participants did not in fact know which type of diabetes they had. Participants verbalised understanding different types exist, but were unable to deduce which type applied to them. The clinic catchment area included the Dargaville and Kaitaia geographical regions. Whangarei composed the biggest proportion of the sample, 52.6% ($n = 60$), Kaitaia totalled 28.9% ($n = 33$), while Dargaville was the smallest at 18.4% ($n = 21$). Differences in participants' numbers were expected as fewer clinics occur outside the main Whangarei area.

Because of few participants in some of the demographic categories, data were regrouped. For ethnic identity, NZ Pakeha/European and Caucasian were grouped together. Maori who indicated that their cultural identity was crucial or important, were regrouped as 'strongly' Maori. Those who answered being aware of their cultural identity but not being influenced by this or it not being significant, were categorised as 'weakly' Maori. Those who answered under the ethnic category of 'other' included people from Asian, UK etc. Marital status was regrouped in two categories: (1) 'single' compromised individuals who answered being single, widowed or separated: (2) the 'married' category included those who were married or in de facto partnerships. SES was regrouped into three categories in order to have greater equality among the participants in each category.

This study included a question about past/present mental health and other physical problems due to the high prevalence rates indicated in the literature. Reported mental health problems included anxiety, depression and schizophrenia. Reported physical problems included renal concerns, problems with walking (feet), blood pressure, sight and heart.

Table 2
Demographic characteristics of the sample (N = 114)

Variable	Frequency (*n*)	Valid percent
Gender		
Male	57	50.0
Female	57	50.0
Ethnic identity		
NZ Pakeha/European	49	43.0
Strongly Maori	18	15.8
Weakly Maori	36	31.6
Other	11	9.6
Marital status		
Married	72	63.2
Single	42	36.8
Socio-economic status (annual income per household)		
$ 0 to $19 999	45	39.5
$ 20- $29 999	33	28.9
> $30 000	36	31.6
Family history of diabetes		
Positive	73	64.0
Negative	41	36.0
Concurrent physical/mental health problems		
Positive	59	51.8
Negative	55	48.2
Experiencing complications due to diabetes		
Positive	54	47.4
Negative	60	52.6

Measuring Instruments

In order to measure the variables identified in this study, a number of questionnaires were used.

Demographic Questionnaire: This questionnaire was developed with the aim of gathering biographical and demographic detail from the client's perspective versus obtaining information from the medical file. Information included in this questionnaire was type of diabetes and length of illness, concurrent problems such as mental health issues, family history of diabetes and complications with the disease, age, ethnic identity, etc. (see Appendix A). All questions were answered directly on the questionnaire.

Automatic Thoughts Questionnaire (ATQ): This was developed by Hollon and Kendall (1980) to identify the presence, extent and severity of automatic thought patterns with primarily depressed individuals. The validity and reliability results reported are alpha, 0.96 and split-half reliability coefficient, 0.97, $p < .001$. Deardorff, Hopkins and Finch (1984) used this measure with factory workers in determining the relationship between negative thoughts and industrial absenteeism. They reported alpha coefficient levels of 0.92 for their sample.

As the background research indicated, depression is prevalent amongst diabetes patients and it is recommended they be screened for this. This is a 30-item index with responses weighted in a Likert type scale (see Appendix B). Scores range from a minimum of 30 to a maximum of 150. The higher the score, the more indicative it is of greater frequencies of negative thoughts. For the present sample the internal consistency of the ATQ was 0.98 ($n = 114$). Consistent with the literature and original design of the test, the total score was used to determine the presence and extent of automatic negative thoughts.

Ways of Coping Checklist (WCCL): This index is a 42-item questionnaire (see Appendix C) developed to measure different coping styles. This instrument has its origin in the transactional model of stress. Lazarus and Folkman (1984) described 'coping' as the individual's ability to constantly change their behavioural and cognitive efforts in managing internal or external demands. The important distinction is that the person perceives the demand as exceeding their resources. Furthermore, coping is also a process in that a dynamic and transactional relationship exists between the person and their environment. The WCCL consists of different subscales, which measure different coping styles. These coping styles are problem focused, seeking social support, blame self and/or others, wishful thinking and avoidance or escape. Strickland and Waltz (1990) reported on the alpha coefficients of this scale as follows: problem focused (0.68), social support (0.76), blaming (0.70), wishful thinking (0.79), and avoidance (0.72). The authors reported that this instrument was relatively uncompounded by the individual's background, biographical and existing mental health problems. For the present sample the internal reliability scores were: problem focused (0.87), social support (0.42), blame (0.77), wishful thinking (0.90) and avoidance (0.88).

Compliance Rating Scale (CRS): The aim of this questionnaire was to obtain data regarding the potential differences between staff and patient perceptions. The dependent variable was ascertained by using the CRS which has behavioural, attitudinal and life-style components. A self-and-staff rating form was developed by the researcher (see Appendix D and E). The questionnaires each consisted of 20 items. Value weights were assigned to each question in a 5 point Likert scale, with a maximum score of 80. Factor analysis (not shown) revealed that a single factor provided the best solution for each CRS scale. The CRS total self score accounted for 42.6% of item variance and the CRS-staff

score, for 30.24% of the variance. High levels of internal consistency were found for the CRS-self and the CRS-staff (alpha = 0.81 and 0.91 respectively).

Depression Inventory (DI): This measure (see Appendix F) was used in a New Zealand study exploring depression as a function of life events and social support (Clarke & Jensen, 1997). It is an 18 item self-report scale, using a 5 point rating base. Weight assigned for each item ranges from 0 to 4. The maximum score is thus 72. The higher the score, the more indicative of symptoms and behaviour associated with depression. This particular scale was used as the aim was not to identify clinical depression, but rather to use an instrument sensitive to depressive-type presentations in individuals. For the present study the coefficient of internal consistency was 0.94, which accounted for 53.33% of item variance.

Table 3 illustrates the identified variables for this study as well as the various psychometric questionnaires that were used in order to evaluate these.

Table 3

Variables and measuring instruments used

Variable	Instrument
Sociodemographic	
Age	Demographic
Gender	Demographic
Socio-economic status	Demographic
Ethnic identity	Demographic
Psychosocial	
Family history of diabetes	Demographic
History of physical and/or mental health problems	Demographic
Psychological variables	
Cognitive strategies	ATQ
Depressive symptoms	DI
Coping styles	WCCL
Dependent variables	
Participant perception of compliance	CRS-self
Staff perception of compliance	CRS-staff

Note. ATQ refers to the Automatic Thoughts Questionnaire, DI is the Depression Index, WCCL refers to the Ways of Coping Checklist and the CRS is the staff and self Compliance Rating Scale

Procedure

The theme of the research was discussed with staff from the Diabetes Clinic during one of their weekly staff meetings. They indicated a willingness to participate in such research and this discussion time was used to explore possible parameters of the research theme. In the formulation of the research question and design, assistance was also received from the cultural officer (Apiha Maori) in order to facilitate culturally safe research. Once there was agreement amongst these two primary sources, the research question was finalised with the assistance of the supervisor at Massey University in preparation for ethical approval. Included in this application was the recognition and incorporation of guidelines from the Health Council of New Zealand regarding research with Maori. Ethical approval was granted from the Massey University Human Ethics Committee.

Staff told patients presenting at the Diabetes Clinic about the research. The researcher met with those potentially interested to explain the study. Once consent was received (see Appendix G & H), the participants were given the 'pack' containing the questionnaires. Individuals completed these questions while waiting for their appointments at the clinic. Some requested that the questions be read to them, or certain words or questions explained more fully. An office at the clinic was provided to do this privately. The participants returned the questionnaires in their envelope pack directly to the researcher once completed. Completing the questionnaires took on average between 30 to 35 minutes. As the participants were in regular contact with the clinic, any psychological complications could be noticed and handled directly by the clinic. Provision was however made for further psychological assistance in the case of adverse reactions, which was not required during this study.

Staff were also provided with a information and consent form (see Appendix I). Staff needed to complete their Compliance Rating Scales for the participants. Most requested to do this during the week, as on clinic day they were time pressured. They returned the completed forms in sealed internal mail envelopes to the researcher. Participants were invited to self-address an envelope if they required feedback from the study. These envelopes were kept separate until a preliminary summary and discussion of the findings was posted.

Risk factors associated with demographic and background variables were tested to establish their association with the dependent variable. In addition, the mean raw scores for male and female were compared for ways of coping, negative automatic thoughts, depression and compliance. Mean raw scores were also compared in relation to other variables such as ethnic identity. The scores of the CRS-self were compared with the CRS-staff to evaluate differences in perception regarding compliance outcome ratings. Hierarchical regression analysis was used to ascertain independently the factors associated with compliance (see Figure 3).

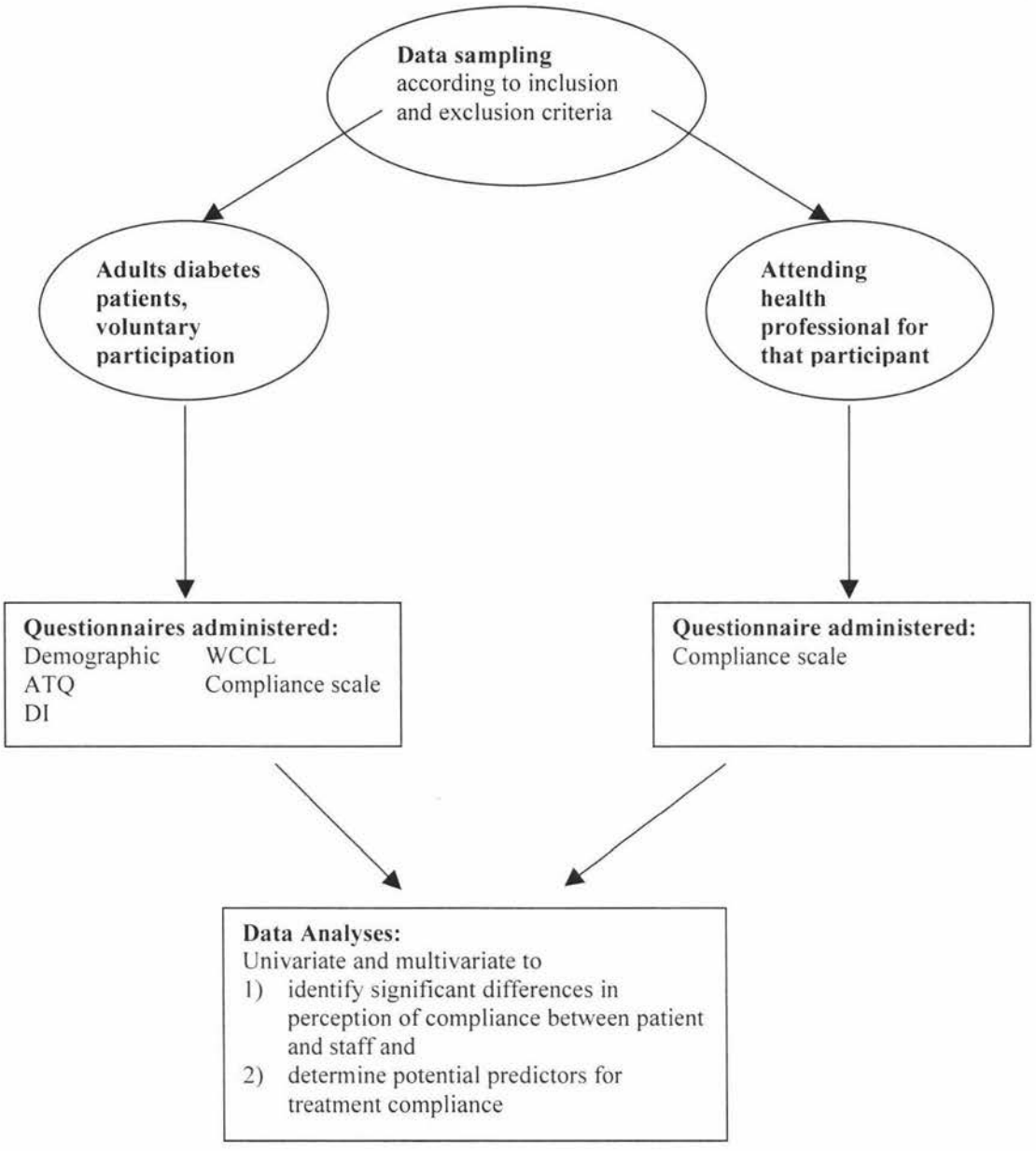

Figure 3. Study design

CHAPTER III

RESULTS

Comparisons between demographic groups

Means and standard deviations for the total gender and ethnic sample appear in Table 4. A series of multivariate analysis of variance (MANOVA) revealed that there were no overall significant differences between men and women on the variables, $F(9, 89) = 1.54$, $p > .05$, Wilks'$\lambda = .86$, or between Maori and European groups, $F(9, 89) = 1.32$, $p > .05$, Wilks'$\lambda = .68$. Similarly, there were no significant differences in means with regards to marital status, $F(9, 89) = 0.74$, Wilks'$\lambda = .93$, family history of diabetes, $F(9, 89) = 1.77$, Wilks'$\lambda = .85$, presence of diabetes complications, $F(9, 89) = 1.35$, Wilks'$\lambda = .88$, or a previous/current history of mental health or physical problems, $F(9, 89) = 1.09$, Wilks'$\lambda = .90$.

Table 4

Means and standard deviations of the variables for gender and ethnic identity

Variables	Male		Female		Maori		European	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Coping styles								
Problem focused	1.61	0.69	1.67	0.75	1.63	0.65	1.72	0.74
social support	1.59	0.56	1.70	0.41	1.61	0.50	1.62	0.49
blaming	1.44	0.99	1.15	0.91	1.42	1.02	1.07	0.96
wishful thinking	1.85	1.00	1.55	1.00	1.90	0.96	1.46	0.94
avoidance	1.50	0.81	1.52	0.83	1.61	0.83	1.45	0.76
ATQ	63.16	28.58	61.24	28.30	65.74	26.93	56.27	27.30
Depression	28.10	14.34	27.30	14.39	29.21	14.09	26.37	14.09
Compliance								
self-rating	54.88	9.13	54.46	9.55	52.91	9.53	56.17	8.97
staff-rating	43.12	8.67	42.52	10.13	39.47	8.32	46.93	9.11

No overall significant differences in means between Types 1 and 2 diabetes groups were present, $F(9, 89) = 1.54$, $p > .05$, Wilks'$\lambda = .86$. However, analysis indicated a multivariate difference between the means of the group who knew what type of diabetes they had and the group which did not know their type. This difference was unlikely to have resulted from sampling error alone, $F(9, 89) = 3.89$, $p < .05$, Wilks'$\lambda = .72$. The group that did not know their type, had significantly higher scores on variables of wishful thinking, avoidance and depression (see Table 5). The group who did not know their type also had significantly lower scores on compliance self-rating. People who didn't know their type were more inclined to experience symptoms associated with depression, rating themselves as being less compliant and used coping styles of wishful thinking and avoidance.

Table 5

Means and standard deviations for knowledge of type of diabetes

Variable	Knows type ($n = 52$)		Type not known ($n = 47$)		F	R^2
	M	*SD*	*M*	*SD*		
Coping styles						
Problem focused	1.69	0.77	1.59	0.65	0.46	0.01
social support	1.56	0.50	1.74	0.47	3.38	0.03
blaming	1.05	0.97	1.57	0.87	7.71	0.07
wishful thinking	1.31	1.0	2.13	0.84	18.88*	0.16
avoidance	1.18	0.84	1.87	0.61	20.99**	0.18
ATQ	53.81	27.54	71.47	26.45	10.54	0.98
Depression	22.63	14.54	33.30	11.84	15.80*	0.14
Compliance						
self-rating	56.19	10.26	52.98	7.86	3.01*	0.03
staff-rating	45.77	9.34	39.55	8.39	12.03	0.11

*p < .05 **p < .001

Multivariate analysis further revealed differences between the SES categories and the presence of automatic thoughts. The second classification group with an annual household income from $20 – $29 999 thousand ($M$ = 72.03, SD = 28.85), were more inclined to experience negative thought processes than the higher income (M = 51.86, SD = 24.73) or lower income group (M = 62.30, SD = 28.33), $F(18, 176) = 0.95$, $p < .05$, Wilks'λ = .83). MANOVA of geographical area revealed a significant difference in comparing the mean scores as related to self and staff compliance ratings. The post-hoc analyses revealed that the above differences were related specifically to the Dargaville and Kaitaia areas, with little evidence of contributing variance from the Whangarei region. In this regard, participants from Dargaville rated themselves lower on compliance than the comparative Kaitaia means. Dargaville staff results in turn revealed that they rated their patients as significantly higher on compliance than the other groups, $F(18, 176) = 1.72$, Wilks'λ = .72 (see Table 6).

Table 6

Means and standard deviations for self and staff compliance ratings by geographical area

	CRS-self				CRS-staff			
Area	*F*	*n*	*M*	*SD*	*F*	*n*	*M*	*SD*
Area	6.41*				1.56*			
Whangarei		60	54.43	8.59		49	43.14	11.23
Dargaville		21	49.67	9.66		21	45.19	4.83
Kaitaia		33	58.69	8.60		29	40.55	8.12

Note. Totals for CRS-staff are less than 114 due to missing data

*$p < .05$

Post hoc analysis (Bonferroni) similarly showed individual differences regarding staff compliance scores as they related to the ethnic categories, and specifically weakly Maori versus NZ Pakeha/European categories. Results showed that staff rated the weakly Maori category as being less compliant in comparison with the other ethnic groups, $F(12, 243) = 1.2$, Wilks'$\lambda = .78$. No significant differences in mean scores were observed between those who identify as NZ Pakeha/European and strongly Maori in this regard (see Table 7).

Table 7

Means and standard deviations for self and staff compliance ratings by ethnic catagory

	CRS-self				CRS-staff			
Variable	*F*	*n*	*M*	*SD*	*F*	*n*	*M*	*SD*
Ethnic category	1.51				5.86*			
Stongly Maori		15	51.73	9.04		15	41.27	7.22
Weakly Maori		31	53.42	9.52		31	38.55	8.65
NZ European		43	56.81	8.92		43	46.88	9.10
Other		10	54.67	9.30		10	40.90	9.67

Note. Totals are less than 114 due to missing data

*$p < .001$

Correlation of variables

Results from Pearson correlation (see Table 8), showed that negative thoughts correlated significantly and negatively with self and staff compliance ratings (-.62 and -.22 respectively). Self compliance ratings were positively related to problem focused strategies, and negatively related to depression. The more depressed individuals perceived themselves to be, the more their ability to comply was adversely affected (-.54). Automatic negative thoughts were very strongly correlated with depression (.73). Experiencing symptoms of depression was also positively correlated with the use of certain coping styles such as wishful thinking and blaming. Avoidance as a coping style, was strongly correlated (.78) with symptoms of depression. Younger individuals were more likely to use strategies of blaming and wishful thinking. Certain coping styles correlated highly with each other for example wishful thinking with avoidance (.79) and perhaps wishful thinking served as a form of avoidance within this study sample. Using a problem focused coping style was found to correlate positively with perceived social support.

Table 8

Correlation, means, standard deviation and alpha coefficients for the variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Age	--									
2. Depress	-.08	.94								
3. ATQ	.05	.73**	.98							
4. Socsup	-.11	.35	.29	.42						
5. Blame	-.24*	.67**	.60**	.29	.77					
6. Wishful	.20*	.75**	.57**	.30	.71**	.90				
7. Avoid	-.15	.78**	.57**	.28	.66**	.79**	.88			
8. Pfocus	-.17	.02	-.16	.30**	.61	.12	.11	.87		
9. CRS-self	.01	-.54**	-.62**	.01	-.43**	-.46**	-.47**	.22*	.81	
10. CRS-staff	.07	-.09	-.22*	-.01	-.09	-.16	-.19	.14	.20*	.91
Mean	59.21	27.70	62.19	1.65	1.30	1.70	1.51	1.64	54.67	42.82
SD	14.96	14.30	28.31	.49	.95	1.01	.67	.72	9.30	9.39

Note. Coefficients of internal consistency for the scales (Cronbach's α) appear in the diagonal.

*p < .05 **p < .01, two-tailed

Hierarchical multiple regression

Hierarchical multiple regression analysis determined the direct effects of the variables in relation to compliance outcomes. Table 9 shows the R^2, R^2 change and levels of predictive significance. For both the CRS self and staff, step one included the ATQ. Step two added the DI scores. Step three was adjusted taking into account problem focused coping. Step four added blaming as coping strategy while step five included wishful thinking. The last step took into account avoidance as a coping strategy.

The results indicated that in this particular sample, 43.7% of the variance in compliance self-rating outcomes, could be accounted for by the variables included. The adjusted population R squared indicated that 41% of variance in compliance outcomes, had been accounted for by the independent variables. Therefore, the identified variables appeared to represent the factors that needed to be taken into consideration when attempting to measure compliance outcomes.

The significant levels (ANOVA regression) of CRS-self scores, indicated that the included variables together had good predictive results free of sampling error $F(6, 107 = 13.84, p < .001)$. The independent variables together had less predictive value for the CRS-staff scores, although adequate to conclude the results were not by chance alone, $F(6, 92) = 2.13, p = 0.5$.

Self-rating results revealed that automatic negative thoughts predicted poor compliance outcomes while being problem focused, predicted better compliance. ATQ accounted for 10.6% of unique variance in scores while problem focused coping accounted for 5.2%. According to the staff ratings, the best predictor of poor compliance was the presence of automatic negative thoughts as well as depression. Depression contributed 4.8% uniquely to the compliance outcome rating while negative thoughts accounted for 4.6%. None of the other variables were found to predict compliance in the staff rating forms, $F(98) = 2.19$.

Table 9

Hierarchical regression for variables predicting compliance ratings

	CRS- Self						CRS-Staff					
Variable	*B*	*SE B*	*t*	*% r²*	*R²*	*adjusted R²*	*B*	*SE B*	*t*	*% r²*	*R²*	*adjusted R²*
ATQ	-0.14	-.40	-3.57***	.11	.38	.37	-0.11	-.33	-2.12*	.05	.05	.04
Depress	0.06	-.10	-0.68	.00	.40	.39	0.29	.44	2.15*	.05	.06	.04
Pfocus	2.37	.19	2.41**	.05	.42	.41	1.61	.12	1.20	.02	.07	.04
Blame	0.14	.02	0.14	.00	.43	.40	1.19	.12	0.78	.01	.07	.03
Wishful	-0.97	-.11	-0.78	.00	.43	.41	-0.96	-.10	-0.52	.00	.09	.05
Avoid	-1.23	-.11	-0.80	.00	.44	.41	-4.08	-.35	-1.81	.03	.13	.07

Note. Results reported are for final step (6) of the regression analysis

*p < .05 **p < .01 ***p < .001

CHAPTER IV

DISCUSSION

In this section risk factors associated with compliance outcomes are discussed as well as differences regarding patient and staff compliance perceptions.

Biological and physical risk factors

The findings suggested gender per se, did not effect observer or subjective outcome ratings and no differences were apparent with regards to the variables of depression, coping style and presence of negative thoughts. In line with trends found in the literature review, the current research supported the hypothesis that there was no overall gender differences related to compliance outcomes.

Ethnic differences were however found on the staff compliance rating forms where Maori (and specifically those who identified as weakly Maori), were evaluated to be less compliant than the NZ Pakeha/European group. This difference was more prominent, but not significantly so, with Maori males than Maori females. Reasons in understanding these results may firstly be related to staff ethnic beliefs and attitudes and/or secondly to the ambiguous nature of ethnic identity. Testing staff beliefs would face its own limitations and difficulties as these may relate to personal as well as organisational mores. The second hypothesis may refer to the concept of marginalised cultures. Love and Whittaker (2000) described culture as a system that 'coded' the way an individual interacts with their environment. If an individual identifies as 'weakly' part of a group, such an individual may not have a clear idea or guide on how to act, interpret and understand their place in relation to their world. Diabetes sufferers face a long-term and difficult task of managing a disease while fitting into their environment. Without

clear direction on how to accomplish this, the individual may indeed be less successful on outcome measures when compared with other groups. Cultural differences in comprehension and communication, may be relevant concepts. Bradley et al., (2001) reminds of the difficulties some patients and staff experience in understanding each other and incorporating practical treatment suggestions given different lifestyles and belief systems.

Most participants in this study reported a family history of diabetes. These results were expected given the aetiology and epidemiology discussed in the literature review. However, the results indicated that having a level of knowledge and experience of the disease through previous exposure, in no way contributed to the patient's compliance with treatment. In addition, 47.4% (n = 54) of the participants experienced complications associated with diabetes. Experiencing personal negative consequences had no significant effect on compliance with treatment. This result points to a conclusion that knowledge of the disease (whether as observer or personal experience), its treatment and complications does not necessarily equate to better outcomes. While this study did not explore whether past learning was in the form of negative or positive role models, it seems a fair statement that current diabetes sufferers are exposed to a variety of clinics/assistance and treatment information. The finding that this is not linked to better outcomes, is important given the amount of resources often spent on client education within clinics. One of the questions on the compliance rating form was whether staff had to repeat treatment instructions. Some of the participants verbalised that regardless of how well they were doing and whether they understood instructions or complied with them, the staff continued to 'educate' them. Participants expressed frustration with this behaviour. The findings from this research supported the patient views in that even with up-to-date information, patients were still not able to apply this with an aim of achieving desired outcomes.

Authors Coates and Boore (1996) reported on how education, as a form of treatment, did not work. Their review of literature focused on the effectiveness of an educational model and the aim of greater compliance. They found that improving patient knowledge had the least effect on compliance outcomes as the model was unable to take into account the many other factors that potentially impacted on compliance.

The relationship of socio-demographic factors to compliance

No overall differences regarding age in relation to the variables were found. There was however age differences regarding different coping styles used, which indirectly effected compliance. Results indicated that those individuals skewed towards the bottom of the profile (i.e. younger), were more inclined to use blame and wishful thinking as strategies. In correlating coping strategies with compliance scores, it was found that both blaming and wishful thinking negatively impacted on the patient's ratings of compliance. Therefore, younger patients rated lower on compliance than the older members of this sample.

With SES it was found that the middle income group, i.e. those between 20 to 29 thousand dollars annual household income, were more inclined to experience automatic negative thoughts. While the SES thus does not directly impact compliance, the regression analysis indicated staff rated automatic thoughts as a significant predictor of compliance outcomes. In addition, the patient self-ratings also indicated negative thoughts to be inversely correlated to the compliance scores. It is therefore possible to conclude that SES does impact on self and staff compliance ratings so far as it relates to the amount/extent of negative thoughts experienced in this population group. Northland has unique socio-economic characteristics. This area is described as below the annual income rates compared with the rest New Zealand (www.stats.govt.nz, 2001 census). As

the results from this research indicate a relationship between SES and negative thoughts, Northland diabetics may be especially vulnerable to corresponding weaker compliance ratings.

Within the three geographical areas included in this study, individual differences were noted. People attending clinic in Dargaville significantly rated themselves as less complaint compared with Whangarei and Kaitaia. In contrast, the staff from Dargaville rated these same patients as more compliant than patients from other areas. Reasons for this discrepancy may be hard to determine. Are patients from Dargaville perceiving staff to be dissatisfied with their treatment outcomes, or it is a case of these patients being more reflective or pessimistic regarding their own efforts? Another possibility may be that Dargaville staff are inclined to view their patients as compliant regardless of other indicators such as patient feedback. If it was a case of the patients being more pessimistic, higher ATQ scores for this group could then be expected. The Post Hoc comparisons did not support such a theory as no significant mean score differences for the three areas were noted. The staff and patients' scores on CRS- item 5 (patient blood-test results) were compared as a more objective indicator. The Dargaville staffs' average rating was 3 (often), (n = 21). In comparison, self-rating scores ranged between 1 (rarely) and 4 (always) with an average of 2 (sometimes). It appears that patients and staff draw different conclusions from the same blood-test results.

No statistically significant differences were found regarding marital status as it related to the variables. It is interesting however to note that the single group rated their own compliance slightly higher than the married group. This may be related to difficulties some patients verbalised in keeping to the suggested treatment/diet when the rest of the household had a different lifestyle. Although not significant, the staff also rated compliance of the single group somewhat higher.

Knowing the type of diabetes suffered was related to compliance outcomes. Those individuals who did not know their type were more inclined to participate in wishful thinking and avoidance as coping strategies, become more depressed and ultimately be less compliant with their treatment. The staff compliance results reflected the same trend, although not to the degree whereby it became a significant indicator. The results point to the importance of patients being able to identify and understand what type of diabetes they have. It is possible that those patients who foresee the importance of such understanding, may also be those who are seeking to have greater outcome control. The individual who sees no significance in knowing their type, may in comparison be more laissez-faire with managing the disease. Empowerment may be an important consideration in this regard. The results from this study supported other research findings regarding the applicability of empowerment and motivational interviewing in treatment (Anderson, Arnold, et al., 1995; Doherty & Roberts, 2002), as well as having negotiated and individualised treatment plans (Lorenz et al., 1996). These theoretical frameworks are based on the premise that only that which is significant to the client, is likely to result in any change. The practitioner is then encouraged to work *with* the client in identifying areas of change and negotiating if these areas differ from those identified by the practitioner.

Relationship of coping styles with compliance

With wishful thinking, individual differences were found with Maori versus NZ Pakeha/European. The results point to a comparative tendency of Maori to employ wishful thinking more often as a coping strategy. On this scale it also appears that mostly males were inclined to use this strategy. The least often used coping style in this

population sample, was the strategy of blaming. No significant difference was present, although NZ European females tended to use this the least.

The correlation results indicated that different coping styles did effect compliance outcomes. The hypothesis that blaming and avoidance would adversely effect compliance was supported. Likewise, as reported in the literature, Patients who perceived themselves as using a problem focused coping style on the other hand, were more confident in their abilities to manage their condition. In summary, coping styles such as blaming and avoidance did adversely effect adherence while being problem focused increased compliance outcomes.

Relationship of depression and negative thoughts to compliance

Although not significant, the results indicate that Maori people were more depressed than NZ Europeans. It was also found that the males in the sample were more inclined to depression than the females. When the results of this study are compared with the mean and standard deviation scores from the earlier NZ study (Clarke and Jensen, 1997), the diabetic population had higher mean depression scores than the earlier study. The comparative scores are: males 28.8(15.08) versus 21.59(11.30), females 26.63(14.41) versus 24.82(12.55), Maori 29.21(15.0) versus 26.33(11.73) and European 26.37(14.09) versus 22.38(12.11). In addition, complications such as often found in long-term diabetes sufferers, significantly impacts on the individuals ability to recover from depression (Lustmand, Freedland, Griffith and Clouse, 1998).

Negatives thoughts and depression were correlated to the use of blame as a coping strategy along with avoidance and wishful thinking. The more an individual made use of these coping strategies, the more inclined they were to experience negative thoughts and

depression. This meant that negative thoughts and depression were inversely related to compliance.

Patient and staff perceptions of compliance

These results have been included in previous discussions as they applied. In summary, staff were more inclined to view individuals who identified as weakly Maori as being less compliant. No age or gender differences were found between the staff and patient group. Regional differences indicated that the staff of Dargaville perceived their patients to be more compliant than other areas. Staff saw the presence of negative thoughts as a prominent predictor of poor adherence to treatment regimes. This may point to a tendency for staff to be focused on perceived client attitudes i.e. how is their mood, do they co-operate and feel free to ask for help, etc. Sadly, this seems to point to an inclination of staff to evaluate compliance potentially based on how well the patient is following their directions or relating to them as professionals. If the patient is inclined to disagree with the staff, this could result in their demeanour being evaluated as less co-operative and hence less compliant. Patients in turn felt that attitude/thought patterns also played a central role but they included being problem focused as a predictor. What needs to be remembered is that the problem focused questions of the WCCL do not indicate the level to with the patients agreed with the staff or followed their directions. Rather, it is about action. Examples of such items include: "changed or grew as a person in a good way, made a plan of action and followed it, took things one step at a time or, stood your ground and fought for what you wanted". From the examples, patients may perceive themselves as compliant regardless of staff perceptions or objective measures such as blood tests. This is because the research results indicated patients rated their own compliance with little reference to how they were following health care advice. Rather,

compliance outcomes related to their judgement of ability to act (do something), monitor negative thoughts and maintain a manageable mood level. Research by Lane et al., (1993) discussed the importance of locus of control and its significance to glucose levels. They found that patients who perceived themselves as having a greater locus of internal control, were more likely to manage their condition. The patient's choice of action may however not be what the health care professional had originally advised but, as the patient nonetheless believes they are maintaining compliance due to their decided action, they may be at a loss to understand why the staff are not supportive or encouraging. It becomes easy to envision a scenario where patient and staff are both concerned about the process of care, as they are approaching the disease management from different angles.

Significant differences between staff and patient perceptions were present regarding issues such as medication use, attendance of appointments, adhering to special diets, etc. These types of questions were more in line with what staff valued as being important. The patient may indeed understand the value of taking medication, but does not appear to place the same emphasis on the above aspects associated with compliance measures.

Predictive compliance factors

Negative thought patterns were found to have an inverse correlation with both self and staff compliance ratings. The prevalence of these thoughts was high in this study sample. As they were instructed to answer these questions as relating to having and coping with diabetes specifically, the results provide an indication of how negative an impact they view this disease to have in their lives. Within this sample, 51.75% ($n = 59$) of the participants experienced negative thoughts. As negative thoughts patterns are likely to have a strong influence on the development and maintenance of depression (Hollon

and Kendall, 1980), we would then expect a correlation and prediction that this sample is also likely to be depressed. This was confirmed by the research finding. A logical deduction is that behaviours such as loss of hope and motivation, uncertainty about future etc. (ATQ) are also symptoms and behaviours associated with depression. Authors Becker and Janz (1985) reported on how diabetes sufferers need a lifetime of treatment regimes only to never receive a 'cure' for their condition. These authors pointed to the importance of motivational aspects as part of treatment. In addition, Doherty and Roberts (2002) reported on the 'bi-directional' process of compliance. This highlighted that low moods would effect diabetes control but that poor control would also result in low moods. Routinely incorporating monitoring and discussion of psychological well-being in a treatment plan, was found to increase patient's energy levels, result in better mental health and allow the patients to perceive greater levels of emotional support (Pouwer, Ader, Snoek, Heine & Van der Ploeg, 2001). Therefore, automatic thoughts and depression are primary issues in diabetic compliance outcomes. In terms of predictive value, the research results indicated the presence of automatic negative thoughts directly and adversely effected compliance self-ratings. With staff ratings, negative thoughts as well as depression served as predictors of compliance outcomes.

The results from this study indicate a dynamic interplay between the factors discussed. This appears to confirm the conceptual model originally proposed for this study (see Figure 2) in that a variety of psycho-social factors impact on each other and thus both directly and indirectly effect treatment outcomes. The patient and staff then need to be aware of not only objective outcome indicators (such as blood glucose levels) but perhaps more importantly, those psychodynamic factors that can effect such indicators.

Use of psychometric instruments

As part of the research, patients were asked to complete a variety of questionnaires. At the present time, the patients do not routinely complete such forms. The research results indicated the importance of staff being aware of aspects regarding mood, nature and content of thoughts and different coping styles. Reliability analysis indicated high levels of internal consistency with all measures used, bar the social support subscale of the WCCL. The questionnaires were able to significantly differentiate subjects regarding the areas tested. This indicates that using such instruments may be a useful and necessary tool in understanding these aspects of the client.

To have psychometric screening in place would imply that each individual presenting at a clinic, complete questionnaires. As a person's mood, thoughts and coping abilities may change over time, this would further imply that the clients be tested on a regular basis. Such an arrangement may be ideal but has practical limitations. These include the time needed to complete the forms and the lack of psychological services to administer, mark and interpret these answers. In addition, should little rapport between client and practitioner exist, the patient may not be inclined to answer questions comprehensively or honestly.

Such limitations might be addressed by using the clinical diagnostic interview as an alternative for identifying high-risk patients. Once such patients are identified, it would be a matter of referral to the appropriate service or even creation of new services. The research findings would indicate that it is possible to predict psychological compliance indicators, and as such, Northland patients would benefit from these areas being targeted in their treatment programmes.

Limitations of the study

The findings of the current research must be viewed within the context of the study's limitations. Threats to internal and external validity are discussed.

Threats to internal validity: The aim and objectives of the study was explained to the participants. It is possible that this created a participant bias situation whereby the participant tried to answer in the manner they believed was expected of them (Sarafino, 1998). It is also possible that participants experienced evaluation apprehension (Coolican, 1996) leading to concerns about how their behaviour would be judged. Participants may have wished to be seen as normal or average and this could have resulted in them answering questions in a manner minimising problems while overestimating the positive. It would have been more appropriate had the true purpose of the study been withheld from the participants (single-blind procedure) till a feedback session occurred. Furthermore, the questionnaires were marked by the researcher which could have resulted in scoring bias. A preferable situation would be that an independent person completed the scoring. However, such scoring bias may have been minimised in the current study through the method of participants rating their own views directly on the questionnaire and using the scoring criteria for the questionnaires (DI, ATQ, WCCL).

Reliability analysis of the WCCL indicated poor internal consistency for the social support subscale. Because of this, the effect of this variable was excluded from the hierarchical regression analysis. It is therefore not clear what role social support might play in compliance considerations. Information for the literature review reports on better glucose control with perceived social support (Kutz, 2000; Skinner, John & Hampson, 2000). In the current study however, such a relationship remains speculative.

Qualitative aspects were not included in the scope of this study. While this may have helped control for participant and researcher bias, the qualitative information could illuminate the nature of the perceived compliance differences between staff and patients. Participants expressed views regarding the service received or what they thought was needed. It would be useful to explore the effect these beliefs and experiences had on their compliance ratings. From the current research design it is not possible to draw conclusions regarding the meaning behind such scores.

Threats to external validity: A question exists in terms of population validity. The convenient nature of the sample meant that the research only included patients who attended out-patient clinics connected with the Northland Diabetes Centre. Given the high prevalence rates of diabetes in the general population, other diabetes patients may use private health care providers. It is unknown if such private patients have different compliance and treatment outcomes and whether the results from the current study could be generalised to private patients.

In terms of ecological validity, it is unclear if the effects found would be valid in other areas. The scope of this research did not include all geographical regions that fall in the Northland catchment area e.g. rural regions. While there is no hospital in such areas, diabetic patients receive a level of follow-up care. Such communities may have unique compliance considerations. In the three areas included in the current study, some differences were noted. If such differences exist in the other areas as well, a case for individualised geographical treatment approaches may need to be considered.

The compliance rating scales need further refinement. The reliability analysis indicated good internal consistency, however construct validity is questionable. This is due to the research findings indicating staff and patients value different concepts when judging compliance ratings. Without a shared conceptual definition of compliance

between staff and patient, differences in perceived outcomes are likely to continue. Standardisation of the CRS would also be useful to establish the percentage of adult diabetics falling between certain scores in order to determine criteria ranges of compliance outcomes.

Further recommendations

In view of the above, it is recommended that this research be duplicated to verify results and perhaps include other geographical areas of New Zealand to further the body of predictive research in this regard. Knowledge regarding predictive indicators of diabetes compliance is limited. This research focused on selected psychological factors. Additional predictive factors may be identified in research focussing on other psychological variables or research from other disciplines.

This research pointed to a conclusion that different perceptions between staff and patients exist regarding compliance outcomes. The nature and extent of these differences would be an area of study in its own right. Research using case studies with a discourse analysis emphasis, is suggested. This may help determine the meaning or importance of factors the patients perceive to be salient in good compliance outcomes. Such a process also needs to be completed with the staff, as without this, we would not be closer to a shared conceptual view of 'compliance'. If a congruent view existed, both staff and patients may perceive the treatment plan to be mutually beneficial. This is important as research has shown compliance increases with an expectation that treatment would be beneficial (Meyer et al., 2002).

Recruitment of research participants outside central care facilities such as private clinics and rural areas, are indicated. As the current research was limited to

patients connected with the Diabetic Centre, the ability to generalise the findings is restricted. The geographical areas in this study indicated somewhat different compliance patterns. Hence caution in using these findings to describe Northland diabetic adults as a group, is necessary. Inclusion of alternative participant sources and regions should enable greater individualised service provision based on the identified needs of the different communities.

A high co-morbidity rate of mental health and physical problems is usually found. The reported physical problems were mostly related to the side effects of a poorly managed condition (the reader is referred to the literature review on complications). However, the reason for the high rates of mental health problems, is less obvious. Research points to the presence of especially depression in diabetics (e.g. Anderson et al., 2001; Ciechanowski et al., 2000; Gavard et al., 1993). Within this sample, other Axis 1 conditions were often sited e.g. schizophrenia and other psychotic disorders. It would be interesting to explore this occurrence and the potential effects on both mental health and diabetes service providers.

This study also pointed to the need for standardised and routine screening of individuals in order to identify those at higher risk for poor compliance outcomes. The first contact person for these patients should be equipped with the ability to perform such a screening. Future researchers may wish to look at establishing and testing the effectiveness of a semi-structured interview process in this regard. Ultimately, once predictive factors have been identified, the challenge lies in developing treatment programmes that target high-risk individuals. The focus of research would now shift to determine the success of developed programs. The gold standard might be a pre-and post intervention study.

CHAPTER V

SUMMARY AND CONCLUSIONS

Variables effecting compliance

This study's focus was on identifying psychological variables related to and predicting compliance. The findings have been discussed elsewhere; in short these are:

1. Younger people tend to use blaming and wishful thinking more readily as a coping strategy. These coping strategies adversely affect the individual's ability for positive compliance outcomes.
2. SES is associated with compliance in that the middle income group with annual household earnings of $20 – $29 999, are more likely than the lower or higher income groups to experience automatic negative thoughts.
3. Patients who do not know what type of diabetes they suffered from, are more likely to have negative compliance ratings. This study indicates that 48.2% (n = 55) of the participants did not know what type of diabetes applied to their situation.
4. Geographically, Dargaville patients rate their own compliance levels as being significantly lower than the rest of the sample. The Dargaville staff however, rate these patients as being significantly higher on compliance than the rest of the sample.
5. Using a problem focused coping style relates positively to compliance outcomes. This approach is not necessarily linked to following the directions of staff, hence some differences between staff and patient compliance ratings are found.

6. Using coping styles such as blaming, avoidance and wishful thinking is found to correlate positively with the development of depressive symptomatology.
7. The diabetic population as a group may be characteristically depressed. The average scores for this group were compared with the mean scores from another New Zealand study (Clarke & Jensen, 1997). Results show a directional trend towards diabetes patients being more depressed.
8. A significant and positive correlation between negative thoughts and depression is observed. Those with negative thought patterns are more likely to experience symptoms associated with depression. More than half this sample (51.75%, $n = 59$) experience negative thoughts related to suffering from diabetes.
9. Patients tend to rate their compliance higher than staff rate their compliance. A significant difference is found between self and staff ratings on the weakly Maori category. Staff perceive this group as less likely to comply with treatment than the other ethnic classification categories.
10. Staff and patient results indicate that the presence of automatic negative thoughts predict poor compliance outcomes (hierarchical multiple regression).
11. Using a problem focused coping style is a significant predictor for better compliance outcomes. For the patients, negative thoughts contributed a predictive value of 10.6% while being problem focused contributed another 5.2%.
12. Staff results indicate that the presence of depression also serves as a predictor of poor compliance. Depression and automatic thoughts are found to contribute about equal unique variance to this analysis (4.8% and 4.6% respectively).

Therapeutic applications

Biological and demographic risk factors: The literature review indicates that a family history of hyperglycaemia could result in a predisposition to develop especially Type 1 diabetes (Surwit & Schneider, 1993). This may mean that children of identified diabetics need to have their glycaemic levels screened as a preventative and early identification method. However, this would imply that the patient caseload of diabetes centres would increase considerably. As there is also some evidence that malnourished babies during the pregnancy are at risk for later stage diabetes development (Hales & Barker, 1992), diabetes centres and health care providers may need to consider expanding their professional networks to include pre-natal clinics.

Addressing SES as a compliance risk factor is problematic. The correlation found between low SES groups and the presence of negative thoughts, creates a high at-risk group for Northland patients. This is because Northland is a 'poorer' region compared with the rest of New Zealand. Encouraging increased work participation, higher wages etc., are concerns that can perhaps only be directed on national level. It then becomes even more crucial that we as practitioners develop, employ and evaluate our methods and frameworks to strive towards greater positive outcomes. The shift this research is alluding to, would mean clinics aim to primarily address the needs as identified by the client. Diabetes education and blood-glucose testing may always form part of the treatment regime, but unless the factors the clients identify as being central to compliance outcomes are addressed, ambivalent and costly treatment outcomes are likely to continue.

The role of body-weight as a health risk factor is receiving attention. We need only think of advertisements such as the "push play for 30 minutes a day" campaign. The success of such campaigns may be limited due to the current research finding and those

reflected by others (e.g. Coates & Boore, 1996) concluding that 'educating' people to bring about behavioural change, may be a limiting approach. These aspects may be important directions for future research.

As a family history or the presence of complications had little effect on compliance outcomes, it does not appear that patients 'learn' either from their own or others' experiences. Diabetic 'education' as a method of behavioural change may need to be re-examined. It is suggested that the nature of such education move from providing facts e.g. about what to do and eat towards teaching patients methods of decision making and goal implementation. The rational for this lies in the findings reflected both in the current research and the literature review that providing instructions/facts are insufficient to take into account psycho-social factors that effect compliance outcomes. A framework to address this is discussed under therapeutic processes.

Poor compliance outcomes are reported in the literature as being a consideration with especially minority groups. This tendency was reflected in the current research, but more specifically in relation to those individuals who may have experienced a level of ambiguity regarding their cultural identity. In may become essential for practitioners to develop programs that not only treat the disease, but also support minority groups in their spiritual and/or cultural uncertainty. As the population structure of Aotearoa/New Zealand changes to incorporate many cultures, so the manner in which treatment is approached may need to be adapted as well. Treatment plans may also need to be geographically based, taking into account the unique characteristics of those communities.

Coping, depression and negative thoughts: As previous research has indicated that stress and hyperglycaemia are associated, incorporating stress management in the

treatment program may prove useful. In addition, there are differences regarding age and coping abilities. The coping styles younger individuals use, place them at greater risk for developing poor outcomes. The coping styles of younger people may change as they grow older, but the danger lies in the depression becoming chronic (Lustman et al., 1997) with concurrent poor adherence to antidepressants (Hirscheld et al, 2002).

Coping styles and negative thinking have been liked by this research as well as past studies (Hodgson, 2000; Lustman et al., 1998) to the development of depression and there is little doubt that diabetics are at risk to experience symptoms of depression, regardless of their age. Perhaps the more important conclusions concern the predictive value of the psychological components (negative thoughts, depression and coping style). As the diabetes centre in this sample is part of the medical services, the psychological component of the treatment is very much a recent "add-on" approach. It seems that the role of the psychologist or counsellor in such services needs to be revisited as the identified predictive factors fall within the practice scope of Human Sciences. This conclusion is supported by others (e.g. Snoek & Skinner, 2002) who have reported on the increasing role psychologist play in the diabetes area.

Therapeutic processes

The interaction of the variables are complex, indicating certain demographic factors as well as coping styles, negative thoughts and symptoms of depression may interact with each other in effecting compliance outcomes. This is compounded by the fact that staff and patients are often in disagreement regarding adherence (Saraino, 1998). The findings from the current study supported such a conclusion in that staff predictors of

positive compliance outcomes were centred around patient attitudinal aspects while the patients placed emphasis on their thought content as well as the ability to act/decide. The implication is that a difference regarding the operand definition of 'compliance' exists for these two groups. It seems a likely conclusion that in order to obtain satisfactory service provision, the patient and the practitioner should be working on the same treatment plan or goal. The success of this goal has, according to the literature review (Bradley 2001), historically been measured to the extent that the patients follow staff instruction and have good blood- glucose levels.

Future treatment directions would then need to take into account the content of the thoughts i.e. positive or negative (Hollon & Kendall, 1980) as well as the underlying beliefs about the illness and treatment (Becker & Janz, 1985), the expectation of treatment benefit (Meyer et el., 2002; Cormier, 2002) and the patients' perceptions regarding their locus of control (current study). One potential solution may lie in the type of treatment framework used.

Motivational interviewing: In the current study, patients reported perceiving greater levels of compliance when they chose some plan or action. Previous research has pointed to the success and importance of being client focused with diabetes sufferers. Motivational interviewing proposes a model whereby change occurs when the clients choose their own plan and goals. The importance of the patient's belief about what they are trying to achieve (Health Belief Model) is what drives this process of change. This research supports the appropriateness in using such frameworks, (the reader is referred to the above mentioned authors for greater detail on the frameworks). As the patient population from this study is attended to within a multidiscipline clinic, consistency across disciplines in applying the frameworks is indicated. Not only the

psychologist/counsellor, but all staff need to be comfortable working from within a approach that aims to empower and guide the client on their chosen path of change. These frameworks also incorporate principles of skills training in coping abilities (Mendez & Belendez,1997), problem solving skills (Nezu et al., 2003) and negotiating treatment goals (Lorenz et al., 1996), which have been found to be successful in bringing about change for the patients. Implementing such frameworks may imply further staff training.

It is perhaps fitting to conclude with the research conducted by Cox and Gonder-Frederick (1992, p. 635), which summarises the current findings. These authors indicate that psychology has a major treatment role to play as psychosocial factors have a greater predictive mortality rate in diabetic patients than many physiological and medical variables. Research questions need to move forward from general queries of "what affects compliance" to "what individual, social, and environmental factors influence what specific self-care behaviour?"

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APPENDIX A

Client number ☐☐☐☐

Date:_____

DEMOGRAPHICS

Date of birth _____/_____/_____
(Month) (Day) (Year)

Age: _____

Gender: _____Male _____ Female

Please tick the appropriate spaces and fill in the blank spaces where asked.

Nationality:

Self:

__ NZ Maori Iwi _____

If you identify as Maori, how important/significant is the Maori language, culture, spirituality in your DAILY life? (please tick which one)

☐ crucial

☐ important

☐ aware of, but does not influence daily life

☐ not that significant

__ NZ European/Pakeha
__ Caucasian
__ Pacific Islander
__ Asian
__ Others: Specify:_____

Work and household:

Unemployed or on benefit
__Yes- What type of benefit _____
__ No

Occupation (Self): _____
(Partner): _____
__ part-time
__ full-time

Marital Status:

__ De Facto partnership
__ Married
__ Single
__ Separated
__ Widow

Total Household Income before any deductions:

__ $ 50,001 plus
__ $ 40, 001- 50, 000
__ $ 30,001- 40, 000
__ $ 20,001- 30,000
__ $ 10,001- 20,000
__ < $10, 000

In what *year* were you diagnosed to have diabetes? _____

Type of diabetes: Type 1 _____
(please tick) Type 2 _____

Risk Factors in dealing with Diabetes

A number of factors and stressors may affect your coping abilities. Please tick the boxes that are relevant to you and fill in the spaces provided.

☐ I have previously been diagnosed with other physical or a mental health problem
What was diagnoses? _____
_____
_____
_____

☐ Biological family members who are/were diagnosed with Diabetes? Please tick one or more

___ father
___ mother
___ brothers or sisters
___ grandparents
___ aunts or uncles
___ other (please specify e.g. cousins, adopted family members etc.)
_____

☐ I have had severe physical consequences or complications to being a diabetic, like:

___ blindness
___ amputations
___ nerve damage
___ heart complications

___ renal failure
___ other _____

☐ The rest of the household has a different lifestyle and eating habits to mine

☐ I have major and/or current stressors in coping with daily life
If yes, what are these? _____
_____
_____

☐ Any other factors that you think affects your ability to deal and cope with diabetes
Positive factors _____
_____
_____

Negative factors _____
_____
_____

All information provided will remain confidential. Thank you for your participation.
Please place the questionnaire back in the envelope provided and give to staff.
Return person: Tanya Goosen
[redacted]

APPENDIX B

Client number ☐☐☐☐

AUTOMATIC THOUGHTS QUESTIONNAIRE

Below are a variety of thoughts that sometimes pop into people's heads. Examples of the thoughts given below are mostly negative thoughts, as we are trying to see if these may affect how people cope with Diabetes.

Please read each one and circle the number indicating how often, if at all, the thought occurred to you over this last week. They are rated on a scale from 0 to 4.

0 – Never
1 – Rarely
2 – Sometimes
3 – Often
4 – Always

1. I feel I am up against the world	**0**	**1**	**2**	**3**	**4**
2. I'm no good	**0**	**1**	**2**	**3**	**4**
3. Why can't I ever succeed?	**0**	**1**	**2**	**3**	**4**
4. No one understands me	**0**	**1**	**2**	**3**	**4**
5. I've let people down	**0**	**1**	**2**	**3**	**4**
6. I don't think I can go on	**0**	**1**	**2**	**3**	**4**
7. I wish I was a better person	**0**	**1**	**2**	**3**	**4**
8. I'm so weak	**0**	**1**	**2**	**3**	**4**
9. My life is not going the way I want it	**0**	**1**	**2**	**3**	**4**
10. I'm so disappointed (displeased) in myself	**0**	**1**	**2**	**3**	**4**
11. Nothing feels good anymore	**0**	**1**	**2**	**3**	**4**
12. I can't stand this anymore	**0**	**1**	**2**	**3**	**4**
13. I can't get started	**0**	**1**	**2**	**3**	**4**
14. What's wrong with me	**0**	**1**	**2**	**3**	**4**
15. I wish I was somewhere else	**0**	**1**	**2**	**3**	**4**

ATQ (page 2)

0 – Never
1 – Rarely
2 – Sometimes
3 – Often
4 – Always

16. I can't get things together	**0**	**1**	**2**	**3**	**4**
17. I hate myself	**0**	**1**	**2**	**3**	**4**
18. I'm worthless (useless)	**0**	**1**	**2**	**3**	**4**
19. I wish I could just disappear	**0**	**1**	**2**	**3**	**4**
20. What is the matter with me	**0**	**1**	**2**	**3**	**4**
21. I'm a loser	**0**	**1**	**2**	**3**	**4**
22. My life is a mess	**0**	**1**	**2**	**3**	**4**
23. I'm a failure	**0**	**1**	**2**	**3**	**4**
24. I'll never make it	**0**	**1**	**2**	**3**	**4**
25. I feel so helpless	**0**	**1**	**2**	**3**	**4**
26. Something has to change	**0**	**1**	**2**	**3**	**4**
27. There must be something wrong with me	**0**	**1**	**2**	**3**	**4**
28. My future is bleak (without hope)	**0**	**1**	**2**	**3**	**4**
29.It's just not worth it	**0**	**1**	**2**	**3**	**4**
30. I can't finish anything	**0**	**1**	**2**	**3**	**4**

All information provided will remain confidential. Thank you for your participation.
Please place the questionnaire back in the envelope provided and give to staff.
Return person: Tanya Goosen
[redacted]

APPENDIX C

Client number

WCCL-R

This checklist looks at different ways in which people deal with their daily problems. It is rated on a scale from 0 to 4. Please circle the number that best describes the way you tend to deal with your situations, such as being a diabetic.

0 – Never
1 – Rarely
2 – Sometimes
3 – Often
4 – **Always**

1.	Used diabetes to get special social treatment.	**0**	**1**	**2**	**3**	**4**
2.	Talked to someone to find out about the situation	**0**	**1**	**2**	**3**	**4**
3.	Blamed yourself	**0**	**1**	**2**	**3**	**4**
4.	Hoped a miracle would happen	**0**	**1**	**2**	**3**	**4**
5.	Concentrated on something good that could come out of the whole thing	**0**	**1**	**2**	**3**	**4**
6.	Accepted sympathy and understanding from someone	**0**	**1**	**2**	**3**	**4**
7.	Criticized or lectured yourself	**0**	**1**	**2**	**3**	**4**
8.	Wished you were a stronger person-more optimistic and in control	**0**	**1**	**2**	**3**	**4**
9.	Tried not to burn your bridges behind you, but left things open somewhat	**0**	**1**	**2**	**3**	**4**
10.	Got professional help and did what was recommended	**0**	**1**	**2**	**3**	**4**
11.	Ignored the problem	**0**	**1**	**2**	**3**	**4**
12.	Realized you brought the problem on yourself	**0**	**1**	**2**	**3**	**4**
13.	Wished you could change what happened	**0**	**1**	**2**	**3**	**4**
14.	Changed or grew as a person in a good way	**0**	**1**	**2**	**3**	**4**
15.	Made a plan of action and followed it	**0**	**1**	**2**	**3**	**4**

WCCL (page2)

0 – Never
1 – Rarely
2 – Sometimes
3 – Often
4 – Always

16. Felt bad that you couldn't avoid the problem	**0**	**1**	**2**	**3**	**4**
17 . Talked to someone who could do something about the problem	**0**	**1**	**2**	**3**	**4**
18. Wished you could change the way you felt	**0**	**1**	**2**	**3**	**4**
19. Accepted the next best thing to what you wanted	**0**	**1**	**2**	**3**	**4**
20. Came out of the experience better than when you went in	**0**	**1**	**2**	**3**	**4**
21. Asked someone you respected for advice and followed it	**0**	**1**	**2**	**3**	**4**
22. Kept your feelings to yourself	**0**	**1**	**2**	**3**	**4**
23. Daydreamed or imagined a better place or time than the one you were in	**0**	**1**	**2**	**3**	**4**
24. Had fantasies or wishes about how things might turn out	**0**	**1**	**2**	**3**	**4**
25. Tried not to act too quickly or act impulsively	**0**	**1**	**2**	**3**	**4**
26. Changed something so things would turn out right	**0**	**1**	**2**	**3**	**4**
27. Got mad at the people or things that caused the problem	**0**	**1**	**2**	**3**	**4**
28. Talked to someone about how you were feeling	**0**	**1**	**2**	**3**	**4**
29. Just took things one step at a time	**0**	**1**	**2**	**3**	**4**
30. Thought about fantastic or unreal things (like perfect revenge or finding a million dollars) that made you feel better	**0**	**1**	**2**	**3**	**4**
31. You knew what had to be done, so you doubled your efforts and tried harder to make things work	**0**	**1**	**2**	**3**	**4**
32. Came up with a couple of different solutions to the problem	**0**	**1**	**2**	**3**	**4**
33. Wished the situation would go away or somehow be finished	**0**	**1**	**2**	**3**	**4**

WCCL (page 3)

0 - Never
1 - Rarely
2 - Sometimes
3 - Often
4 – Always

34. Tried to forget the whole thing	**0**	**1**	**2**	**3**	**4**
35. Accepted your strong feelings, but didn't let them interfere with other things too much	**0**	**1**	**2**	**3**	**4**
36. Tried to make yourself feel better by eating, drinking, smoking, taking medicine	**0**	**1**	**2**	**3**	**4**
37. Changed something about yourself so you could deal with the situation	**0**	**1**	**2**	**3**	**4**
38. Avoided being with people in general	**0**	**1**	**2**	**3**	**4**
39. Kept others from knowing how bad things were	**0**	**1**	**2**	**3**	**4**
40. Stood your ground and fought for what you wanted	**0**	**1**	**2**	**3**	**4**
41. Refused to believe that it had happened	**0**	**1**	**2**	**3**	**4**
42. Slept more than usual	**0**	**1**	**2**	**3**	**4**

All information provided will remain confidential. Thank you for your participation.
Please place the questionnaire back in the envelope provided and give to staff.
Return person: Tanya Goosen
[redacted]

APPENDIX D

Please fill in your name: _____
(first name only)
Client number

COMPLIANCE SELF RATING SCALE

In answering the next set of questions, I will be asking you your opinion about the treatment process. There is no right or wrong answer. These questions relate to how people deal differently with diabetes.

The questions are rated on a scale from 0 to 4. Please circle the number that you think best describes your opinion.

0 – Never
1 – Rarely
2 – Sometimes
3 – Often
4 – Always

1. It's easy to attend most appointments made	**0**	**1**	**2**	**3**	**4**
2. I always remember to take my medication	**0**	**1**	**2**	**3**	**4**
3. Coming to the clinic is difficult and/or inconvenient	**0**	**1**	**2**	**3**	**4**
4. My treatment plan is working well for me	**0**	**1**	**2**	**3**	**4**
5. My blood tests indicate that the treatment appears to be working	**0**	**1**	**2**	**3**	**4**
6. I have to cancel appointments on short notice	**0**	**1**	**2**	**3**	**4**
7. I substitute suggested foods in my diet with my own choices	**0**	**1**	**2**	**3**	**4**
8. Staff often have to repeat treatment instructions	**0**	**1**	**2**	**3**	**4**
9. I understand why I need a special diet and exercise plan	**0**	**1**	**2**	**3**	**4**
10. I am often happy or in a good mood when attending the appointment	**0**	**1**	**2**	**3**	**4**

CRS (page 2)

0– Never
1– Rarely
2– Sometimes
3– Often
4– Always

11. I am open and accepting of guidance from staff	**0**	**1**	**2**	**3**	**4**
12. The suggested diet is working well for me	**0**	**1**	**2**	**3**	**4**
13. I ask or have asked questions about the medication, it's limitations, risks and benefits	**0**	**1**	**2**	**3**	**4**
14. I have told staff that the diet and medication is intrusive to my lifestyle	**0**	**1**	**2**	**3**	**4**
15. I tend not to tell staff when I forget to take the medication	**0**	**1**	**2**	**3**	**4**
16. I would like more help from the staff	**0**	**1**	**2**	**3**	**4**
17. I am uncomfortable to tell staff when I am not managing my condition	**0**	**1**	**2**	**3**	**4**
18. The system should let me have more control over the treatment of my own condition	**0**	**1**	**2**	**3**	**4**
19. I think that too much fuss is made over me having diabetes	**0**	**1**	**2**	**3**	**4**
20. I think, in general, that I am compliant with treatment.	**0**	**1**	**2**	**3**	**4**

All information provided will remain confidential. Thank you for your participation.
Please place the questionnaire back in the envelope provided and give to staff.
Return person: Tanya Goosen
[redacted]

APPENDIX E

First name of patient: _____

Client number

COMPLIANCE RATING SCALE
(STAFF)

In answering the next set of questions, I will be asking you your opinion or perception about a particular patient/client. There is no right or wrong answer. These questions relate to how people deal differently with diabetes.

The questions are rated on a scale from 0 to 4. Please circle the number that you think best describes your opinion.

0 – Never
1 – Rarely
2 – Sometimes
3 – Often
4 – Always

1. Most appointments made, are regularly attended by the patient	**0**	**1**	**2**	**3**	**4**
2. The patient always remembers to take their medication.	**0**	**1**	**2**	**3**	**4**
3. The patient indicates that coming to the clinic is difficult and/or inconvenient	**0**	**1**	**2**	**3**	**4**
4. The patient's treatment plan is working well for this particular person	**0**	**1**	**2**	**3**	**4**
5. The patient's blood test indicate that they appear to be compliant with suggested treatments	**0**	**1**	**2**	**3**	**4**
6. The patient cancels appointments on short notice	**0**	**1**	**2**	**3**	**4**
7. The patient appears to substitute suggested foods with their own choices	**0**	**1**	**2**	**3**	**4**
8. Staff often have to repeat treatment instructions	**0**	**1**	**2**	**3**	**4**
9. The patient appears to understand why they need a special diet/exercise plan	**0**	**1**	**2**	**3**	**4**
10. The patient is often is happy or in a good mood when attending the appointment	**0**	**1**	**2**	**3**	**4**

CRS (page 2)

0– Never
1– Rarely
2– Sometimes
3– Often
4– Always

11. The patient is open and accepting of guidance	**0**	**1**	**2**	**3**	**4**
12. The patient has indicated that the suggested diet is working for them	**0**	**1**	**2**	**3**	**4**
13. The patient communicates with staff about any difficulties they have with medication	**0**	**1**	**2**	**3**	**4**
14. The patient has reported that the diet and medication is intrusive to their lifestyle	**0**	**1**	**2**	**3**	**4**
15. The patient tends not to tell staff if they forget to take their medications	**0**	**1**	**2**	**3**	**4**
16. The patient asks for additional assistance from staff	**0**	**1**	**2**	**3**	**4**
17. The patient is uncomfortable indicating that they are not managing their condition	**0**	**1**	**2**	**3**	**4**
18. The patient feels that they should have more control over their own condition.	**0**	**1**	**2**	**3**	**4**
19. The patient has given the impression that too much fuss is made over them having diabetes.	**0**	**1**	**2**	**3**	**4**
20. In general, the patient is compliant with treatment.	**0**	**1**	**2**	**3**	**4**

All information provided will remain confidential. Thank you for your participation.
Please place the questionnaire in an envelope.
Return person:

Tanya Goosen
[redacted]

APPENDIX F

Client number

DI (Bell 1982)

This questionnaire consists of 18 statements about how you feel. After reading each question, please circle the number which best applies to you.

0 -Never
1 -Rarely
2 -Sometimes
3 -Often
4 -Always

1. Do you have a feeling of well-being?	**0**	**1**	**2**	**3**	**4**
2. How often do you have crying spells or feel like it?	**0**	**1**	**2**	**3**	**4**
3. How often do you feel you do not enjoy things anymore?	**0**	**1**	**2**	**3**	**4**
4. How often do you feel alone and helpless?	**0**	**1**	**2**	**3**	**4**
5. How often do you feel that people don't care what happens to you?	**0**	**1**	**2**	**3**	**4**
6. How often do you feel that life is hopeless?	**0**	**1**	**2**	**3**	**4**
7. Do you feel tired in the mornings?	**0**	**1**	**2**	**3**	**4**
8. Do you feel that you are bothered by all sorts of ailments (problems) in different parts of your body?	**0**	**1**	**2**	**3**	**4**
9. Have you had periods of days or weeks when you felt that you couldn't take care of things because you couldn't get going?	**0**	**1**	**2**	**3**	**4**
10. Do you have trouble getting to sleep or staying asleep?	**0**	**1**	**2**	**3**	**4**
11. How often do you have trouble with sleeping?	**0**	**1**	**2**	**3**	**4**

0 -Never
1 -Rarely
2 -Sometimes
3 -Often
5 -Always

12. Do you have loss of appetite (enjoyment of food)?	**0**	**1**	**2**	**3**	**4**
13. When things don't turn out the way you hoped, how often do you blame yourself?	**0**	**1**	**2**	**3**	**4**
14. How often do you think about suicide?	**0**	**1**	**2**	**3**	**4**
15. Do you feel that life has changed so much in our modern world that people are powerless (unable) to control their lives?	**0**	**1**	**2**	**3**	**4**
16. Do you wonder if anything is worthwhile any more?	**0**	**1**	**2**	**3**	**4**
17. How often would you say things don't turn out the way you want them to?	**0**	**1**	**2**	**3**	**4**
18. How often does the future seem uncertain to you?	**0**	**1**	**2**	**3**	**4**

All information provided will remain confidential. Thank you for your participation.
Please place the questionnaire back in the envelope provided and give to staff.
Return person: Tanya Goosen
[redacted]

APPENDIX G

Predictors of compliance with treatment among adult diabetes clients in Northland

Participant Information Sheet

Investigator/Researcher: **Ms Tanya Goosen, a Masters candidate in the Department of Psychology, Massey University, Albany Campus, Private Bag 102 904, Auckland. Working as Assistant Psychologist, Adult psychology Service, Northland Health, PO Box, 742, Whangarei;** [redacted]

Supervisor/co-investigator: **Dr Dave Clarke, a Senior Lecturer in the Department of Psychology, Massey University, Albany Campus, Private Bag 102 904, Auckland. Tel: 09 443-9799 ext. 9075; E-mail:** D.Clarke@massey.ac.nz

Request for participation and involvement

As a person who has been diagnosed with Diabetes, you are invited to take part in a study exploring predictors of treatment involvement in adult diabetes clients. In order to evaluate this, questionnaires will be provided for you to answer. This is likely to take up less than 1 hour of your time. Clients within the Diabetes Clinic of Whangarei Base Hospital will be included in the study. Your participation in the study is voluntary (your choice). The aim of the project is to determine which factors, or combination of factors, might be indicators or predictors of treatment compliance in adult diabetes clients.

Benefits, risk and safety factors

Participation in this study will in no manner effect the treatment that you are receiving from your service provider. You may find taking part in this study will allow you to provide us with insight into how diabetes clients cope with their condition. This may allow for future programs to be developed that could target these areas of need. If you have any concerns related to participation in this study, the researcher will gladly be available to talk you through this.

Participant's rights

- Participation in the study is entirely voluntary and you may decline without giving a reason. If you choose not to take part this will not affect any future care or treatment.
- You have the right to decline answering any particular question.
- After all the information has been explained to you and your support people, you will have two weeks to think about participating in this study. This will give you time to

consult with friends and whanau if you choose to. If you are ready, you can proceed immediately to fill out the forms. While it is important that you answer the questionnaires according to your own opinion, your support people will be able to remain with you, while you are busy with the questions.

- If you at first agree and participate but later want the information excluded from the study, you may do so within one (1) month after signing the consent form by informing the researcher directly. You will not have to give a reason and this will not affect any future care or treatment.
- All information given will remain confidential. Your identity (full name, address etc.) will not be disclosed. To protect your identity, numbers or first names will be assigned to the forms answered. Your first name will be needed on the Compliance Rating Scale as the staff have their own rating scale to complete and we need to be certain that all involved are referring to the same person.
- During and at the completion of the study, the information will be held in a locked facility by the researcher. This will further ensure confidentiality. The information will be kept for 10 years in accordance with regulations.
- Please feel free to ask any questions before, during or after your participation in this study.
- If you have concerns about your rights as a participant, you can contact the Health Advocates Trust on 0800 555 050

Results

Should you wish to be given a copy of the research findings, please print your name and address on the blank envelope provided. Deposit it in the sealed box provided, so that it is kept separate from the questionnaires that you are completing. Please contact me or my supervisor if you wish to ask any further questions about the project. As this research is part of a Masters thesis, Massey University Library will also have a copy of the results. Because I will be collecting the information over several months, it may be some time before I am able to mail out the results based on all the information I get from the participants.

This project has been reviewed and approved by the Massey University Ethics Committee, ALB Protoco no MUAHEC 02/089. If you have any concerns about the conduct of this research, please contact Associate Professor Kerry P Chamberlain, Chair, Massey University Campus Human Ethics Committee: Albany, telephone 09 443-9700 ext. 9078, E-mail: K.Chamberlain@massey.ac.nz

If you have any questions, please feel free to contact Tanya, the researcher or the supervisor. Thank You.

APPENDIX H

Predictors of compliance with treatment among adult diabetes clients in Northland.

CONSENT FORM

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF TEN (10) YEARS

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time. I was able to use whanau or support from a friend, if needed, in asking questions to understand this study. Also, if I need an interpreter, every attempt will be made to arrange this. I understand that taking part in this study is my choice and that this choice will not affect my future care. My information will be kept confidential and that I will not be identified in any reports or publications of this study.

I agree to take part in this study under the conditions set out in the Information Sheet and know who to contact with any future concerns or questions.

Signature: _____ **Date:** _____

Full Name - printed _____

APPENDIX I

Predictors of compliance with treatment among adult diabetes clients in Northland

Staff Participant Information Sheet

Investigator/Researcher: **Ms Tanya Goosen, a Masters candidate in the Department of Psychology, Massey University, Albany Campus, Private Bag 102 904, Auckland. Working as Assistant Psychologist, Adult psychology Service, Northland Health, PO Box, 742, Whangarei;** [redacted]

Supervisor/co-investigator: **Dr Dave Clarke, a Senior Lecturer in the Department of Psychology, Massey University, Albany Campus, Private Bag 102 904, Auckland. Tel: 09 443-9799 ext. 9075; E-mail:** D.Clarke@massey.ac.nz

Request for participation and involvement

This research will focus on predictors of treatment compliance in adult diabetic patients. As part of the study, we are interested in ways in which participants feel they are complying with treatment suggestions. This will be measured using a Compliance Rating Scale. The patients and staff will each fill in a different version of this questionnaire. It can then be investigated if there are differences between patient and staff perception regarding compliance.

For each patient willing to participate, you (as attending health professional) will be asked to fill in the corresponding staff compliance form. You name does not appear on this form, only the patients' first name. Your opinion will remain confidential. You will only have to complete one form, and it's likely to take about 10 minutes of your time. Questions will be answered directly on the form. Completed forms are placed in a sealed envelope, which will be collected from the Diabetes clinic by the principal researcher.

A summary of the research results will be sent to the Diabetes clinic upon conclusion of research. As this research is part of formal studies with Massey University, their Library will also have a copy of the results. Because I will be collecting the information over several months, it may be some time before I am able to send out the results. Please contact me or my supervisor if you wish to ask any further questions about the project or feel the need to talk through any aspect of the process, before, during or after your participation has been completed.

Your signature indicates consent to participate in the manner described above.

Signature: _____ *Date:* _____

This project has been reviewed and approved by the Massey University Ethics Committee, ALB Protoco no MUAHEC 02/089. If you have any concerns about the conduct of this research, please contact Associate Professor Kerry P Chamberlain, Chair, Massey University Campus Human Ethics Committee: Albany, telephone 09 443-9700 ext. 9078, E-mail: K.Chamberlain@massey.ac.nz

If you have any questions, please feel free to contact Tanya, the researcher or the supervisor. Thank You.