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**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.

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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 result 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 Mellitus (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) <ul style="list-style-type: none"> 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 lose 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 pancreatitis (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 hyperglycaemia, 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 heart 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.

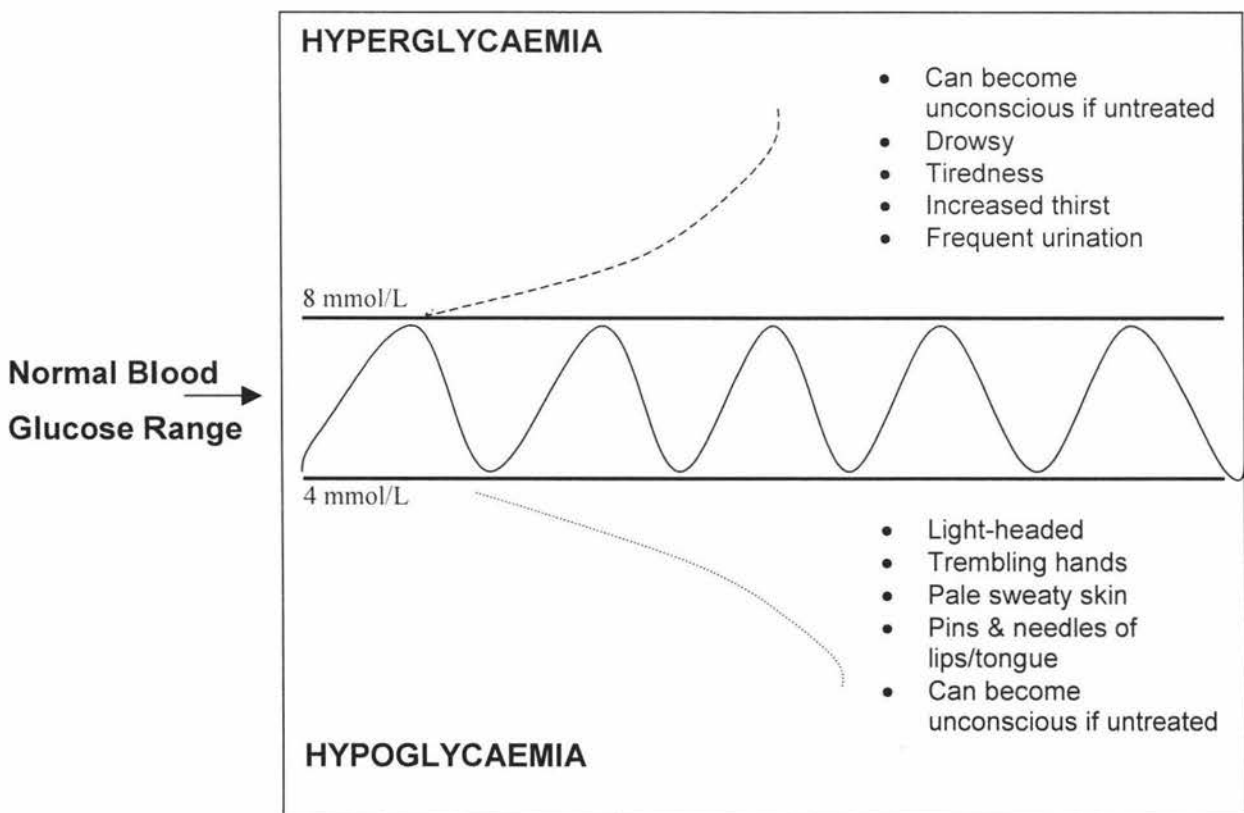


Figure 1. Blood glucose range

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 being 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 & Morrish; 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 than 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 led 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, Griffith, 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.

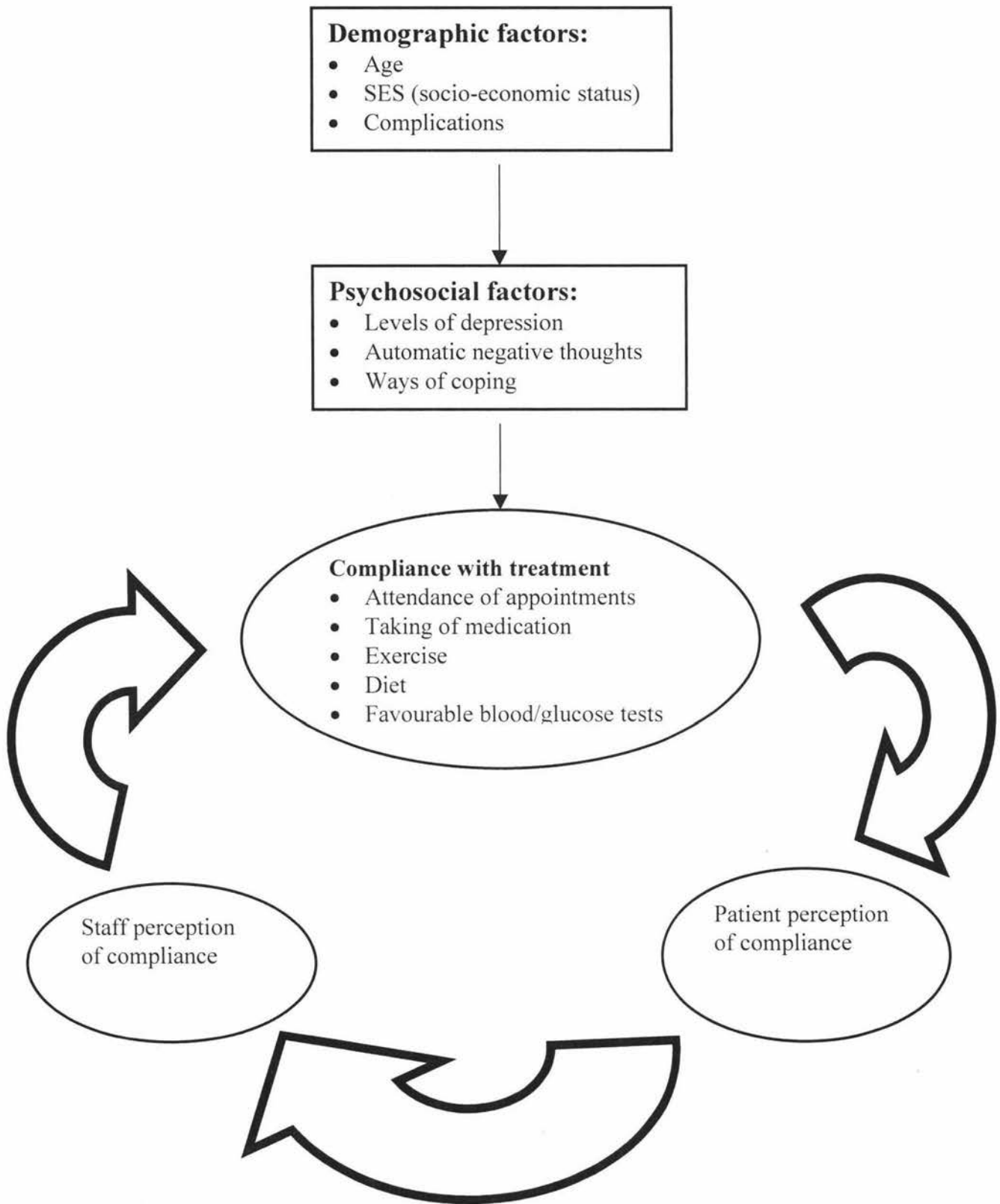


Figure 2. Conceptual framework of the study

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.