The relationship between self-esteem and glycemic control in 13-17 year old adolescent girls with type 1 diabetes mellitus

Annabelle Lucia Sandoval Esparza

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THE RELATIONSHIP BETWEEN SELF-ESTEEM AND GLYCEMIC CONTROL IN 13-17 YEAR OLD ADOLESCENT GIRLS WITH TYPE 1 DIABETES MELLITUS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Nursing

by
Annabelle Lucia Sandoval Esparza

December 2005
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ABSTRACT

Type 1 diabetes mellitus is a metabolic chronic condition, which affects children and adolescents. There are many acute and chronic complications from diabetes mellitus. Good glycemic control is essential in order to prevent and delay complications. Adolescents with type 1 diabetes mellitus face a greater challenge. Adolescents are in a developmental stage in which self-identity and peer acceptance is very important. Self-esteem is affected by chronic illnesses. The purpose of this study was to describe the self-esteem of adolescent girls aged 13-17 years who are diagnosed with type 1 diabetes mellitus living in the Inland Empire and to describe the correlation between self-esteem and glucose control operationalized as their HgAlc. A descriptive, correlational study with quantitative and qualitative data on a convenience sample of ten adolescent girls was conducted. Participant mean age was 15.4 years and the group was predominately Caucasian (50%). The average self-esteem of the sample was 22.20 (range zero to 30) with an average HgAlc of 8.01%. A HgAlc of 7.0% and below is considered optimal. This study did not provide evidence to support that a higher self-esteem was

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correlated to a lower HgAlc. Data indicated that there was a negative relationship between self-esteem and HgAlc \( r = -0.051, p = 0.889 \) as hypothesized, but the correlation was nonsignificant. However, valuable insight into the meaning of their experiences with diabetes was obtained. Three central themes emerged: body image, peer acceptance, and stress.
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DEDICATION

To my husband Chaz, my brother Private Saul A. Sandoval, and my parents.
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result of insulin deficiency and resistance and is mostly seen in older adults; however, this type of diabetes is also emerging in children, in large part because of physical inactivity and obesity, a precursor to type 2 (California Center for Public Health Advocacy, 2004; Guthrie & Guthrie, 2004). Type 1 diabetes can not be prevented, but type 2 can be prevented. Diabetes mellitus is also responsible for acute emergencies and long-term complications. There is no cure for diabetes mellitus but it can be controlled (American Diabetes Association, n.d.).

As of 2000, the World Health Organization (WHO) has estimated the prevalence of diabetes mellitus worldwide to be at least 171 million and in 2030 it is expected to rise to 366 million. According to the Centers for Disease Control and Prevention (CDC) as of 2002 the total prevalence of diabetes in the United States is 18.2 million people, roughly 6.3% of the population. There are 13 million people diagnosed and 5.2 million that are undiagnosed. The prevalence of people under the age of 20 years is about 206,000 or 0.25%. This means that approximately one in every 400-500 children and adolescents are affected by type 1 diabetes (2003).
Diabetes is very costly. In 2002, the American Diabetes Association (ADA) estimated that the cost of diabetes in the United States was $132 billion, with $92 billion directed towards direct medical costs and $40 billion related to indirect costs (2003). In California, the total direct and indirect costs were estimated to more than $17.9 billion per year (California Center for Public Health Advocacy, 2004).

Diabetes is the sixth leading cause of death in the United States (National Vital Statistics System, 2002). During 1996-2000, 115,423 individuals in California died, approximately 23,085 deaths per year (California Center for Public Health Advocacy, 2004). Furthermore, for the year of 2000, the state wide diabetes related death rate was 83.6 deaths per 100,000 people, which is much higher than the national rate of 75.7 deaths per 100,000 people (ADA, 2003; CDC, 2003).

In addition to the expenses and deaths are the complications associated with diabetes mellitus. There are macrovascular, meaning large blood vessels, microvascular referring to small vessels, and neurologic complications (Guthrie & Guthrie, 2004). Diabetes is responsible for nontraumatic amputations, cardiovascular
problems, blindness, and renal disease (CDC, 2003). Nontraumatic amputations accounted for 57,000 per year or 150 per day, blindness accounted for 20,000 per year or 60 per day, and end stage renal disease accounted for approximately 28,000 per year or 70 per day (CDC, 2003).

Diabetes in California represents a dim reality of how many local individuals are affected by this chronic illness. The findings of the 2001 California Health Interview Survey (CHIS) as outlined by Diamant, Babey, Brown, and Chawla (2003), identified that there are 1.5 million or 5.9% of California adults who have been diagnosed with diabetes and another 2 million are at risk. Furthermore, there are more than 12,000 adolescents aged 12-17 that have been diagnosed with diabetes and another 176,000 adolescents are at high risk for obesity, which is a predominant factor to type 2 diabetes. At the county levels, prevalence of adults 18 and over in San Bernardino county is 7%, 4.3% in Orange county, and 7.5% in Riverside. San Bernardino and Riverside counties have exceeded the statewide percentage. With the rising trend, Healthy People 2010 (2002) has identified diabetes as a significant public health concern in the United States.
Diabetes mellitus poses many physical problems for the adolescent girl, but it may also contribute to their developmental progression. Adolescence is a time for independence, exploration, peer acceptance, and self identity (Erikson, 1980). The adolescent girl may feel constrained with the complexities of diabetes mellitus and its strict treatment regimen. Kyngas and Barlow (1995) examined the meaning and impact of diabetes on 51 Finnish adolescents aged 13-17. Central themes that emerged from their qualitative data included that diabetes limited their freedom, it was perceived as a threat to their physical and psychosocial well-being, but it also gave them an opportunity to live a healthier lifestyle. Furthermore, diabetes mellitus may affect the self-esteem of adolescent girls. In a study done by Littlefield et al. (1992), adolescent girls exhibited poorer treatment compliance and metabolic control than boys and girls with poorer adherence reported lower self-esteem.

Statement of the Problem

Adolescence is a developmental time in the life span in which the individual encounters identity versus
identity diffusion (Erikson, 1980). In this stage, it is important for the adolescent to recognize accomplishments and develop their own identity. If the adolescent is unable to attain their identity, identity diffusion occurs and this is derived from self-doubt, which can lower their self-esteem (Erikson, 1980).

Chronic illness can prevent the developmental tasks for the adolescent (Overbaugh & Savin, 1992). Diabetes mellitus can further affect the self-esteem of the adolescent. Pradham, Shah, Rao, Ashturkar, and Ghaisas (2003) identified that self-esteem was found to affect compliance with treatment of thalassemia. Jacobson et al. (1987) found that self-esteem problems have a negative impact on the adaptation and metabolic control of diabetes. High self-esteem was related to exercise adherence and the ability to adjust insulin dosage (Knect, Keinanen-Kiukaanniemi, Knuuttila, & Syrjala, 2001).

Self-care management is essential and necessary for the pediatric diabetic in order to obtain optimal glycemic control. Glycemic control can contribute to the reduction as well as the delay of complications and mortality resulting from diabetes. The Diabetes Control
and Complications Trial (DCCT) demonstrated a relationship between good glycemic control and microvascular complications in patients with type 1 diabetes (1993). Furthermore, the UK Prospective Diabetes Study (UKPDS) demonstrated a decrease in microvascular complications and the risk of a myocardial infarction was reduced by 14% in patients diagnosed with type 2 diabetes with glycemic control (1998).

There has been a lot of research focused on the importance of technical skills and self-management in order to prevent complications; however, there lacks research on psychosocial implications, in particular interest, self-esteem.

Purpose of the Study

The purpose of this study was to explore the psychosocial phenomena of self-esteem in relation to glucose control in diabetic adolescent girls living in the Inland Empire. The following objectives were formulated:

1. To describe the self-esteem of adolescent girls aged 13-17 that are diagnosed with type 1 diabetes mellitus.
2. To describe the correlation between self-esteem and glucose control operationalized as their hemoglobin A1c (HgA1c):

Theoretical Framework

The theoretical framework utilized in this study integrated the components of diabetes mellitus in relation to self-esteem and glycemic control. The theory, by Seymour Epstein (1973), Cognitive-Experiential Self-Theory is composed of two parts pertaining to the self. According to Epstein, the self is derived from a set of beliefs about the self and in relation to the world. There are two parts of the self, the cognitive and experiential. The cognitive self is the rational, informational knowledge that we obtain through education. On the other hand, the experiential self is the self derived from affective experiences and emotions, which is correlated to self-esteem. Hence, the experiential self can be affected by the individual's environment.

The model utilized is a dynamic interrelated process of the individual's environment and the relationship of self-esteem and glycemic control. The environment is identified as their physical surrounding (home, school,
measure self-esteem. The convenience sample limits the generalizability of the results. These results can not be generalized to the adolescent population because only girls were studied and the girls that were studied do not necessarily represent other adolescent girls from other settings. The limited number of participants can not prove or disprove statistical inference and affects the representative sample.

Definitions of Terms

Diabetes mellitus (DM) - A metabolic condition in which the pancreas is unable to make or use insulin. Several acute and long-term complications occur. There are two major types: type 1 and 2.

Type 1 diabetes mellitus / Insulin-dependent diabetes mellitus (IDDM) / juvenile onset - this is an autoimmune disorder of the body. The pancreas can not make any insulin. This is seen in children or young adults and they will need insulin injections for life. This can not be prevented.

Type 2 diabetes mellitus / Non insulin dependent diabetes mellitus (NIDDM) / adult onset - the body can not make enough insulin or can not use the existing
insulin produced. This usually occurs in adults. There are many factors that contribute to this type. This is preventable.

**Self-esteem** - How one thinks of themselves. "A positive or negative attitude toward...self...high self-esteem...the individual respects himself, considers himself worthy...recognizes limitations and expects to grow and improve...low self-esteem...implies self-rejection, self-dissatisfaction, self-contempt" (Rosenberg, 1965, p. 30-31). "...self-acceptance, self-respect, feelings of self-worth" (Rosenberg, 1979, p. 31).

**Glycemic control** - This is indicated by a HgAlc of less than or equal to 7% for a diabetic person as suggested by the American Diabetes Association

**Hemoglobin Alc (HgAlc)** - Glycosylated hemoglobin measures the average blood sugar control over three months. This is measured as a percentage and determines what percentage of glucose has attached to the red blood cells.

**Adolescent girl** - A female individual aged between 13-17 years old.
CHAPTER TWO
LITERATURE REVIEW

The aim of this study was to describe the self-esteem of adolescent girls with type 1 diabetes mellitus, and to determine if there was a relationship between self-esteem and glycemic control. Diabetes mellitus is a public health concern (Healthy People 2010, 2002). In particular, the adolescent who has type 1 diabetes mellitus is facing unique challenges. The adolescent is struggling with physical and psychosocial changes during puberty along with the demanding lifestyle changes associated with diabetes (Erikson, 1980; Guthrie & Guthrie, 2004).

The DCCT (1993) and UKPDS (1998) studies have demonstrated the importance of glycemic control in the prevention and delay of complications. The American Diabetes Association considers that a diabetic is under control when their HgA1c level is 7% or less and action is necessary if the HgA1c level is > 8%. However, physiological responses to puberty have also been correlated with poorer glycemic control in adolescence (Amiel et al., 1986). Furthermore, self-esteem may have
an impact on metabolic control (Lernmark, Persson, Fishert, & Rydelius, 1999). It is imperative that the adolescent is equipped with the necessary diabetic knowledge, technical skills, and emotional support to live with type 1 diabetes mellitus.

Self-esteem

Self-esteem has a great influence personally, socially, and psychologically (Coopersmith, 1981). Self-esteem is usually interchangeable with self-perception and self-concept. For the purpose of this study, self-esteem is defined as a self evaluation, an attitude of approval or disapproval, and the extent to which someone believes to be capable, significant, worthy, and successful (Coopersmith, 1981). Self-esteem is a personal judgment expressed as an attitude (Coopersmith, 1981). Rosenberg (1965) defines self-esteem as how one thinks of oneself, usually a positive or negative attitude. Self-esteem refers to self-worth, self-respect, or how one regards or feels about oneself, it is an emotional or affective perception. On the other hand, self-concept refers to the total identity perception in which self-esteem and self-consistency are
motives of the self-concept (Rosenberg, 1979). Furthermore, self-efficacy refers to the ability to perform certain functions to achieve desired events (Bandura, 1997). Hence, self-esteem may affect behavior (self-efficacy).

Coopersmith (1981) suggests that people with high self-esteem have less fears, ambivalence, and self-doubt and are able to be realistic and accomplish personal goals. A person with high self-esteem is aware of his capabilities. Furthermore, a person with high self-esteem is happier and more effective in meeting demands than in individual with low self-esteem (1981). Rosenberg (1965) identifies a person with high self-esteem as an individual who “respects himself, consider himself worthy...recognizes limitations and expects to grow and improve” (p. 31). An individual with low self-esteem “implies self-rejection, self-dissatisfaction, and self-content” (Rosenberg, 1965, p. 30-31).

Coopersmith (1981) and Rosenberg (1965) emphasize that interactions with significant others contribute to self-esteem and it is influenced by what others think. Furthermore, Rosenberg (1965) links low self-esteem to anxiety and depression.
Diabetes is a very complex illness and may have a negative impact on self-esteem. Byrne (2000) studied Australian children aged 12-18 years. Anxiety and fear was related to self-esteem for boys in 9th grade. Boys had a lower self-esteem as anxiety increased. For the girls, self-esteem was related to anxiety and fear during 7th, 9th, and 12th grades. The Anderson, Miller, Auslander, and Santiago (1981) study indicates that youth with poorer metabolic control exhibited increased anxiety and lower self-concept. Individuals with type 1 diabetes are at a greater risk for depression and problems with self-concept as associated with eating disorders in adolescent girls with diabetes (Kanner, Hamrin, & Grey, 2003; Maharaj, Rodin, Olmsted, Connoley, & Daneman, 2003).

Self-esteem and Adolescence

There are eight developmental stages in life (Erikson, 1980). During adolescence, the individual is encountering identity versus identity diffusion. To successfully complete this developmental stage, the adolescent must achieve ego identity. Rosenberg (1965) purposes that self-esteem is the lowest around 12-13
years and after the age of 14 it improves. Rosenberg (1965) further postulates that self-esteem is higher in boys than girls.

Palta, Shen, Allen, Klein, and D’Alessio (1996) studied newly diagnosed type 1 diabetes mellitus individuals from Wisconsin between 1987-1992, ages four to 19 years and examined glycemic control in the first 4.5 years after diagnosis using total glycosylated hemoglobin (GHb). Mean GHb of the sample was 11.3%. Higher GHb (greater than or equal to 13%) was associated with more hospitalizations rates per year. It was noted that GHb increased within the first two years of onset, and peaked in the age group of 12-15 years.

Hoey et al. (2001) examined quality of life in adolescents with type 1 diabetes in 17 countries in Europe, Japan, and North America. Their study revealed that lower HbA1c resulted in higher quality of life and lower perceived family burden. Girls reported more worry than boys and an increase in age caused more worry. Girls reported more difficulty with diabetes control than boys. Furthermore, adolescents living with a single parent presented with a lower quality of life.
In the study done by Quatman and Watson (2001), gender differences were noted with self-esteem. Overall boys had a higher self-esteem. In addition, boys had a higher self-esteem in six of eight domains of self-esteem: sense of security, family life, physical appearance, self-assurance (mastery), and athleticism. However, both genders were similar in peer recognition and academic proficiency. Furthermore, Chubb, Fertman, and Ross (1997) examined self-esteem of adolescents in 9th to 12th grade in relation to gender and age. The results of their study showed that self-esteem did not change over the four-year period; however, the male’s self-esteem was higher than the females.

The study done by Graue, Wentzel-Larsen, Hanestad, Batsvik, and Sovik (2003) is inconsistent with Rosenberg’s theory that self-esteem increases after 14 years. They compared healthy and diabetic adolescents, with a mean age 14.5 years, and a mean HbA1c = 9.3% (range 6.2-14%) and found that older adolescents (15-18 years) with diabetes exhibited lower health and well-being than the younger diabetics in regards to behavior, mental health, self-esteem, and general health.
The research findings are consistent with females having lower self-esteem than males. Attention needs to be focused on management of diabetic girls since they are at risk for having lower self-esteem. Furthermore, puberty has been linked with insulin resistance, which can make diabetic management difficult for the adolescent girl (Amiel et al., 1986).

Self-esteem and Chronic Illness

Chronic illness is a long disease process, which is often incurable (Smeltzer & Bare, 1996). Asthma, diabetes mellitus, juvenile arthritis, cancer, and bronchitis are examples of chronic illnesses. Literature shows conflicting information about self-esteem of children and adolescents with chronic illnesses. Differences in illnesses, severity, symptoms, duration, and support may all affect the adaptation to the illness, self-esteem, and metabolic control.

Chronically ill children and adolescents have been identified as having lower self-esteem, poorer body image, and more problems with behavioral and social adjustment in comparison to their healthy peers (Gortmaker, Walker, Weitzman, & Sobol, 1990; Seigel,
Poor self-esteem was related to noncompliance in children and adolescents with chronic renal disease (Korsch, Fine, & Negrete, 1978).

Kyngas and Barolow (1995) examined 51 Finnish adolescents aged 13-17 years with type 1 diabetes mellitus. Interviews were conducted to determine their personal meaning and impact of diabetes. Diabetes was viewed as controlling and limited their freedom and it was a threat to their physical and psychosocial well-being. They experienced feelings of fear, worry, and guilt. In a positive note, some adolescents felt that diabetes enabled them to live a healthier lifestyle. Some of the adolescents examined in this study clearly viewed themselves different from their peers. They felt their diabetes controlled so much of their lives that they had to lie about their self-care to their parents and health care providers. Their findings suggest that adolescents with diabetes need a supportive environment and their coping mechanisms need to be addressed. Feelings of fear, worry, and guilt can have a negative impact on self-esteem. Furthermore, if the adolescent is lying about their self-care, they may not be appropriately
taking care of their diabetes, hence affect their metabolic control.

A longitudinal study done by McNelis et al. (2000) measured self-concept in children ages eight to 13 years (n = 134) at two intervals four years apart. There were no differences in self-concept between both intervals but the children with severe asthma had lower self-concepts at both intervals (p = .08 and p = .06) in comparison to those who had mild asthma. Boys had similar self-concepts despite severity of illness, but girls with worse asthma had lower self-image. In this study, the severity of the illness affected the self-esteem.

Pradham et al. (2003) evaluated 60 children, 30 with thalessemia and 30 with epilepsy and compared the two groups to identify their psychopathology and self-esteem. Their results indicated that self-esteem was low in both groups, but self-esteem of the thalessemia children affected their desire to participate in their management. If the child had higher self-esteem (F = 7.542, p = 0.01) they participated in their care. Furthermore, when the epileptic children felt that their lifestyle had changed they exhibited more anxiety, depression, somatisation, and had lower self-esteem. This study shows that
self-esteem affected disease management; hence, the diabetic adolescent girl with a low self-esteem may be not want to participate in her diabetes management, which may affect metabolic control.

Litt, Cuskey, and Rosenberg (1982) examined the relationship between self-esteem and autonomy to medication adherence in adolescents with juvenile rheumatoid arthritis. Thirty-eight adolescents participated with a mean age of 14.2 years. They found that the adolescents with a higher self-esteem were more compliant than those who were not (6.28 vs 50.6, p < .005). In addition, those who were compliant felt more autonomous (p < .005). It was also identified that their self-image was related to their symptoms, illness duration, and clinic visits.

Huurre and Aro (2002) assessed adolescents with chronic illnesses (diabetes, asthma, allergies, migraine, and skin conditions) to identify if there were any psychosocial effects at ages 16, 22, and 32 years in comparison to healthy peers. Three groups were formulated: limiting chronic illness, non-limiting chronic illness, and healthy group. The group with the limiting chronic illness at 32 years demonstrated
depressive symptoms and lower self-esteem in comparison to the other groups. Lastly, Nicolson and Anderson (2003) examined four focus groups with chronic bronchitis and they identified that their illness impacted their self-esteem. Their sample felt different, they felt a sense of loss, and helplessness.

Other studies showed no difference in self-esteem. Erkolahti, Ilonen, and Saarijarvi (2003) studied the self-esteem of adolescents with type 1 diabetes mellitus, rheumatoid arthritis, and healthy peers. They found no difference in their self-image. Furthermore, Ireys, Gross, Werthamer-Larsson, and Kolodner (1994) examined the self-esteem of young adults aged 20-24 with chronic illness (congenital, musculoskeletal, and nervous/sensory system) and found that their self-esteem was high (30.84, SD = 3.9) as measured by the Rosenberg Self-esteem scale. Although the overall group reported high self-esteem, 25% of the sample had low self-esteem. Cantrell and Lupinacci (2004) compared 45 healthy adolescents to 45 adolescents with cancer. They found that self-esteem did not differ between age or gender and it did not differ between the healthy and ill adolescents. However, when adolescents in the cancer group were off treatment, their self-esteem
was much higher in comparison to when they were on treatment. Furthermore, there was a strong relationship between self-esteem and hopefulness in females and hopefulness was related to their perceived self-esteem.

Finally, Cavusoglu (2001) examined adolescents with insulin dependent diabetes mellitus (IDDM) and acute lymphocytic leukemia (ALL) and compared their self-esteem. There was no difference found in the self-esteem of either group or gender. The self-esteem of the group with IDDM was higher as their illness duration was longer in comparison to those adolescents who were newly diagnosed. Overall self-esteem was higher in the IDDM group and moderate in the ALL group.

Self-esteem and Metabolic Control

There is conflicting literature in the exact role that self-esteem contributes to metabolic control and whether or not self-esteem is a direct or indirect cause of metabolic control.

Maharaj, Olmsted, Daneman, and Rodin (2004) examined 88 adolescent girls with type 1 diabetes mellitus and their mothers in Canada. They investigated how the self-concept and mother-daughter relationship of intimacy
and autonomy contributed to metabolic control. They identified that self-concept, perceived by behavioral conduct, social acceptance, romantic appeal, and close friendships affected their HbA1c. The higher their HbA1c, the lower their behavioral conduct, social acceptance, romantic appeal, and close friendships, but they saw an increase in social acceptance. Higher HbA1c was associated with less intimacy between mother-daughter relationships. Their findings suggest that it is imperative to assist the adolescent girl with enhancing her self-concept and improve the relationships with family and peers. Adolescence is a time in which social acceptance is highly important; however, if the adolescent girl is preoccupied with social acceptance, she may deviate from the behavioral constraints necessary to obtain optimal glucose control.

Jacobson et al. (1987) examined the compliance of 57 children aged 9-15 years with recent onset of IDDM over an 18 month period. Mean HbA1c level was 8.6% within the first nine months and 9.1% during the second nine month period. The areas of compliance measured were diet, insulin usage, and glucose monitoring. The study found that preadolescents (nine to 12 years) were more
compliant than adolescents (13-15 years). Furthermore, they examined psychosocial variables in relation to compliance. They identified that children with higher self-esteem, diabetes adjustment, and social functioning correlated with an overall higher level of compliance. Children with a higher self-esteem adhered to the regimen better.

Murphy, Thompson, and Morris (1997) examined 40 adolescents aged 12-18 years old. Their study aimed to examine cognitive appraisal processes in predicting adherence. Adherence was defined as the daily frequency of glucose testing. Stress, self-esteem, attributional style, locus of control, and family functioning were evaluated. Their results indicated that older adolescents, ethnic minorities, those adolescents with a negative perception of their physical appearance, those adolescents with perceived less control, and those adolescents with an attributional style for negative events had lower compliance.

Furthermore, Hesketh, Wake, and Cameron (2004) noted that children with HbA1c > 8.8% had poorer psychosocial summary scores than children with a HbA1c < 8.8%. Self-esteem was part of the psychosocial domain. Lernmark
et al. (1999) examined diabetes adaptation to depression, self-esteem, and fear. Mean HbA1c for girls 8.2% vs. boys 7.3%. They found that individuals with symptoms of depression exhibited lower self-esteem, had HbA1c levels > 8%, and poor diabetic adaptation.

Knect et al. (2001) examined self-esteem in relationship to adherence to diabetes and dental care. Age range was 16-72 years with a median self-esteem of 27 and mean HbA1c of 8.3%. They found that high self-esteem was related to the ability to adjust insulin and exercise, which are components of self-care management of diabetes. Seventy-two percent of the individuals with high self-esteem had insulin adherence in comparison to 55% of the individuals with low self-esteem; 58% of the high self-esteem individuals participated in exercise whereas only 34% of the ones with low self-esteem did. Sixty-one percent with high self-esteem brushed their teeth vs. 46%. In this study, self-esteem influenced factors associated with diabetes and dental care.

Moussa et al. (2005) compared 349 children six to 18 years with type1 to 409 children without diabetes. Children with bad psychological adjustment exhibited poor glycemic control. Anxiety, depression, and distress were
higher in diabetic children. Diabetic children reported poorer image in their friend’s eyes than the healthy adolescents. Furthermore, children with higher glycemic control (HbA1c > 10%) had higher distress than their peers with HbA1c < 8%.

Other studies have shown no relationship between self-esteem and metabolic control (Kovacs et al., 1985, Kovacs et al., 1990). Kovacs et al. (1990) assessed the first six years post diagnosis of IDDM on children aged eight to 13 years in Pittsburgh. Psychological assessment consisted of anxiety, depression, and self-esteem. Metabolic control was measured as the percentage of glycosylated hemoglobin (% GHb). Initial adaptation resulted in perceived later adjustment. Girls were found to have an increase in anxiety as the illness progressed. Self-esteem remained the same at diagnosis and at six years. There was no relationship between metabolic control and anxiety or depression. The children were well adjusted despite having a stressful illness. In addition, their self-esteem remained positive with poor metabolic control and hospitalizations. However, the longer they exhibited their illness, the more upset they were about its management. This study identified that those children
who exhibited good initial adaptation were able to adjust well at six years follow-up, conversely those who did not initially adapt well had anxiety. Hence, initial assessment of adaptation is necessary to assist the adolescent diabetic girl with diabetes management.

Bryden et al. (2001) did a longitudinal study. Baseline information was obtained at ages 11-18 and then the sample was reinterviewed as young adults. HbA1c level was highest during 15-18 years of age, but mean HbA1c level remained same at baseline and follow-up. Behavioral problems were associated with higher HbA1c and self-esteem was related to adjustment; however, self-esteem was not a predictor to HbA1c.

Johnston-Brooks, Lewis, and Garg (2002) examined self-efficacy and self-esteem in relation to self-care and HbA1c. They identified that self-efficacy had an impact on self-care and glycemic control. Self-esteem was related to diet and exercise self-care but was not as effective as self-efficacy in determining HbA1c. Self-esteem did not have a direct effect on glycemic control; however, self-esteem is related to psychological symptoms, which can correlate to poorer health.
Health practices and self-esteem have been correlated (McNichols, 2002; Yarcheski et al., 2003). Yarcheski et al. (2003) found that both social support \((r = .59, p < .01)\) and self-esteem \((r = .44, p < .01)\) as measured by the Rosenberg Self-Esteem Scale correlated to positive health practices in a sample of 148 adolescents aged 12-14 years. Furthermore, Yarcheski, Mahon, and Yarcheski (1997) identified that perceived health status is a mediator between self-esteem and positive health practices. If the adolescent has a higher self-esteem, then their perceived health status is increased and they are more likely to practice positive health behaviors. However, Connor, Poyrazli, Ferrer-Wreder, and Grahame (2004) determined that age, gender, and ethnicity was not related to self-esteem. It was identified that those individuals with higher self-esteem were more likely to engage in risky health behaviors.

Self-esteem may or may not be a predictive factor to HgAlc; however, it is a mediator to self-care behaviors that are necessary for the diabetic adolescent to do for effective diabetes management, for example, glucose monitoring, dietary habits, exercise, and insulin
administration. In addition self-esteem has been correlated to depressive symptoms, anxiety, and fear.

Summary of Literature Review

The literature highly suggests that females are at a greater risk for having low self-esteem. Furthermore, diabetes management may be affected by the hormonal changes caused by puberty. The literature review reflects mixed results in the association between self-esteem and glycemic control. Illness adaptation, peer acceptance, self-esteem, and health practices have been associated with glycemic control. Diabetes mellitus is a highly interrelated dynamic process, which involves support. Although not all research indicates that self-esteem has an impact on glycemic control, the majority of the studies reviewed indicate a positive association, directly or indirectly, between self-esteem and glycemic control. Moreover, female adolescents are at a greater risk of diabetes management and metabolic control.

Hypotheses

In this study, it is proposed that the self-esteem of adolescent girls with type 1 diabetes mellitus will be low, and their self-esteem will be negatively correlated
with their HgAlc. As their self-esteem is low, their HgbAlc will be high and as their self-esteem is high their HgAlc will be normal or low.
CHAPTER THREE

METHODOLOGY

Introduction

This study design was a descriptive correlational study, which looked at the adolescent's self-reported self-esteem using the Rosenberg Self-Esteem Scale (SES) and their glucose control operationalized as their HgAlc. The aim was to describe the self-esteem level of adolescent girls aged 13-17 that are diagnosed with type 1 diabetes mellitus and to describe the correlation between self-esteem and HgAlc. All information was translated in Spanish to accommodate Spanish-speaking individuals.

Subjects

The convenience sample for this study was comprised of ten adolescent girls aged 13-17 years old living in the Inland Empire with type 1 diabetes mellitus. Participants were excluded if they were not females aged 13-17 and did not have type 1 diabetes living in the Inland Empire.
Setting

This study was performed in the Inland Empire. The Inland Empire is the region of Southern California, which encompasses Riverside and San Bernardino County, from the boundaries of Orange and Los Angeles County to the San Jacinto Mountains to the San Diego County line, Victor Valley and into the Mojave Desert ("Inland Empire," n.d.). There are several cities within this region.

Study Variables

Socio-demographic data was collected on all subjects and included age, age at onset of diabetes, number of people living with them, number of siblings, school grade, ethnicity, annual household income, and perceived social support (see Appendix A). The socio-demographic data collection tool was pilot tested by three adolescent girls between the ages of 13-17 without diabetes to determine reliability and establish tool usability prior to data collection. The socio-demographic data tool was also reviewed by three doctorally prepared nurse educators to determine content validity. The data was collected on their self-reported self-esteem using the Rosenberg Self-Esteem Scale (see Appendix B) and HgAlc
was determined by utilizing the Cholestech GDX A1C portable analyzer and test cartridges.

The Rosenberg SES can be used without explicit permission; however, a letter of use was sent to the Morris Rosenberg Foundation (see Appendix C). The Rosenberg Self-Esteem Scale (SES) is a ten-item Likert scale with a four-point scale from strongly agree to strongly disagree. The scoring on five items is reversed. Points per each question were valued from zero to three. In this study, the points ranged from zero to 30. The Rosenberg SES has a reproducibility of 92%, scalability of 72% (Rosenberg, 1965), and high internal reliability (Cronbach alpha of 0.78, Rosenberg SES, n.d.). The Cholestech GDX A1c analyzer uses one drop of blood from a finger prick, is CLIA-waved, and meets the National Glycohemoglobin Standardization Program (NGSP, 2005) guidelines for precision and accuracy. Training was completed and a certificate was obtained to utilize the Cholestech GDX A1C analyzer (see Appendix D).

Procedure

Approval to begin the study was granted by the California State University San Bernardino Institutional...
Review Board (see Appendix E). Original data collection began in March 2004; however, unsuccessful recruitment efforts restarted the data collection to November 2004 through February 2005. Data collection was initiated and results were gathered, encoded, and placed in a locked filing cabinet. Flyers (see Appendix F) were designed and distributed to clinics, hospitals, a school nurse meeting, the nursing department and health office at California State University San Bernardino, and via e-mail to colleagues, college instructors, and school nurses. Phone calls were made to various school nurses in the San Bernardino County area. A detailed explanation of the study was verbalized to the school nurses. All school nurses were given three methods of communication: personal phone number, home address, and e-mail address. The school nurses reviewed their adolescent health list and informed their diabetic girls about the study. Once the diabetic girls along with their parent/guardian agreed to participate, permission was given to release their phone number. Phone contact was started and appointments were made by the participant's schedule and a location was agreed upon by their convenience. This study was conducted at the location as agreed upon by the
researcher and participants as long as there was an electrical outlet to plug in the Cholestech GDX A1C portable analyzer. In such instances, the study was conducted in my residence, the residence's of the participants, a school office, and at Starbucks. All locations provided confidentiality.

At each location as agreed upon by the researcher and participant, parental/guardian consent was obtained (see Appendix G) on site or the participant had the consent already completed. After parental/guardian consent was obtained, the girls were verbally asked to assent. Each participant received a copy of the child assent (see Appendix H). Once the girl said "yes" an explanation of the procedure was given. The girls were also made aware that they could stop at any minute if they felt uncomfortable and that all information would remain confidential. In some instances, the mother remained in the same room as the girl and the girl was asked if it was okay prior to proceeding.

Upon approval, each girl was given the socio-demographic eight item questionnaire, then the ten-item Rosenberg SES, and finally a finger prick blood sample was self-administered to assess HgA1c. Once they
completed the Rosenberg SES, each response was assigned a number and the numbers were tabulated and a score was obtained. The maximum score was 30 points. High self-esteem was determined by obtaining a score of 15-30 points and low self-esteem was determined by obtaining a score of less than 15. If the girl obtained a score of less than 15, she was advised to speak to her school counselor and/or school nurse. Any questions were answered and clarification was made immediate as the girls filled out the two questionnaires.

Once the questionnaires were completed, the girls were asked if they preferred to use their own lancet or the one touch disposable lancet for the finger prick. In nine out of ten instances, the participants utilized their own lancets for comfort reasons. The participants poked their own finger. The blood was extracted by utilizing the MicroSafe pipette and the blood was placed in the Cholestech GDX A1C test cartridge. The Cholestech GDX A1C analyzer was calibrated each day upon use. During the blood collection, gloves were worn and the disposable lancets and used MicroSafe pipettes were discarded in a red portable biohazard medical waste container. The used Cholestech GDX A1C test cartridges were disposed of in a
plastic bag and in a trashcan. Once the results were displayed on a digital readout, the participants were informed of their HgA1c. In addition comments were collected on their experiences with diabetes.

Each participant received a 3x5 flash card with the results of their HgA1c and their score from the Rosenberg SES. They were encouraged to share the results with their health care provider and parent/guardian. Upon completion, each participant received a $10.00 gift card to Bath & Body Works, they were able to pick out a self-care toiletry item of their choice, and they were asked if they experienced any discomfort. No adverse reaction was noted or verbalized by each of the participants. In addition, all participants were informed that if they referred other girls they would obtain another $10.00 gift card. Flyers were left with them. No referrals were made. The data collection took approximately 15-18 minutes to complete per participant.
CHAPTER FOUR
RESULTS AND DISCUSSION

Data Analysis

The study aimed to describe the self-esteem of adolescent girls with type 1 diabetes mellitus and the relationship between self-esteem and glycemic control. The data collected was quantitative and qualitative. Data collected included socio-demographics, self-esteem, HgA1c, and comments about their experience with diabetes mellitus. The convenience sample of this study consisted of ten adolescent girls aged 13-17 years old with type 1 diabetes mellitus living in the Inland Empire. Girls were excluded from the study if they were not within the age range, did not have type 1 diabetes mellitus, and who were not living in the Inland Empire. Data was entered and analyzed utilizing the computer software SPSS 11.5 for Windows SPSS Inc, Chicago, IL.

Socio-demographic information was collected from all of the participants. Age in years, age of onset of diabetes mellitus, the number of people living with the participant, number of siblings, the school grade, self-esteem scale, and HgA1c were reported as a mean and
standard deviation. Nominal data included ethnicity and household annual income and was reported as a percentage. Nominal data on the perceived support was entered as "yes" or "no" and reported as percentage.

Presentation of Findings

Socio-demographic data was collected and analyzed from ten adolescent diabetic girls. All ten girls meet the inclusion criteria. The average age of the girls was 15.4 years (SD = 1.174, range 14-17 years). The average age of onset of diabetes mellitus was 8.74 years (SD = 4.111, range 1.4-13 years). The average number of people that they live with was 4.80 (SD = 1.398, range 3-7). The average number of brothers that they have was 1.50 (SD = 1.354, range 0-4). The average number of sisters was 0.70 (SD = 0.675, range 0-2). The average school grade was 10.50 (SD = 1.269, range 9-12th grade).

Ethnicity distribution reflected the population as Caucasian 50% (n = 5), Hispanic/Latino 40% (n = 4), and other 10% (n = 1). Household income reflected the population as 30% (n = 3) with a > $60,000 year salary and 70% (n = 7) did not know their annual family household income. The sample population perceived that
they obtained support and help from others reflected 100% (n = 10) mothers, 60% (n = 6) fathers, 40% (n = 4) brothers, 20% (n = 2) sisters, 30% (n = 3) friends, 30% (n = 3) grandparents, 30% (n = 3) aunt/uncle, and 20% (n = 2) received help from others. In this study all the girls had a parent (mother and/or father) so no one checked the “guardian” (n = 0) or the “nobody” (n = 0) item for perceived support and help.

The two major variables that were analyzed consisted of self-esteem and HgAlc. Pearson’s product-moment bivariate correlation was the parametric test used to determine the relationship between the two variables. A scatterplot was utilized to show the relationship between self-esteem and HgAlc (see Figure 2). The average self-esteem of the sample was 22.20 (SD = 5.138, range 13-29) and the average HgAlc was 8.010% (SD = 1.500, range 5.3-10.5%).
Figure 2. The Correlation Between Self-esteem and HgA1c (Analysis Using Pearson’s Product-moment Bivariate Correlation)

In addition to the quantitative data obtained from the demographics, self-esteem scale, and HgA1c, qualitative data was obtained by recording their comments about their experiences with diabetes mellitus. Three central themes emerged from their comments, body image, peer acceptance, and stress.

Comments included the following: Participant #2 had an insulin pump and “likes it because it is really small” and it can be “covered up,” participant #4 had an insulin pump but removed it because it “didn’t work,” no further comments were made to describe why it did not work.
Participant #7 expanded on her comments about body image and peer acceptance by saying she "...had an insulin pump but took it off because...they used to make fun of me...I gained weight and got fat pads...the pump was big and I couldn’t wear some clothes." Participant #5 shared that she "...has had ketones, is in pre-acute renal failure, and wears glasses..." all secondary to diabetes, but states, "...since I have had diabetes great things have happened to me...I am a camp leader (for diabetic summer camp)...I was asked by congress to be a diabetic advocator." Her blood sugar normally runs "200-300" and attributes it to her "celiac disease." Participant #8 recently experienced "stress" as "having problems with my boyfriend." When asked if they knew of anyone else who would be interested in participating in this study, for referral purposes used as a snowball technique, three out of ten participants commented, "...that is not something I talk about with my friends..." referring to diabetes. No referrals were made.

The research study hypothesized that the diabetic adolescent girls with type 1 diabetes mellitus living in the Inland Empire would have a low self-esteem. Secondly, the study hypothesized that there would be a negative
correlation between self-esteem and glycemic control. The data suggests that the first hypothesis was not supported because the self-esteem of the sample was high (22.20, SD = 5.1238, range 13-29). Only one girl (n = 1) or 10% of the population studied had a low self-esteem (13, range 13-29). The second hypothesis was partially supported. There was a negative relationship between self-esteem and HgA1c (r = -.051, p = .889); however, it was nonsignificant.
Conclusions

Diabetes mellitus is a major health concern. Diabetes management is very complex and requires the support of others. Glycemic control is essential in prevention of complications. Adolescence is a time of physical and psychosocial changes. During this time, the adolescent strives to achieve self-identity (Erikson, 1980). The diabetic adolescent girl faces many challenges.

The aim of this correlational study was to describe the self-esteem of adolescent girls aged 13-17 with type 1 diabetes mellitus living in the Inland Empire and to describe the correlation between self-esteem and glucose control. This research was able to describe the self-esteem of the adolescent girls, but this research study did not provide significant statistical evidence to support the correlation between self-esteem and glycemic control.

The average self-esteem of the sample was 22.20 (SD = 1.500, range 13-29), which reflected a high or
positive self-esteem. This finding was inconsistent with previous studies, which show that females generally have low self-esteem (Chubb et al., 1997; Rosenberg, 1965; Quatman & Watson, 2001). Only one participant exhibited low self-esteem (13, range 13-29). Perhaps the disparity was caused by the fact that both genders were not compared. Had they been compared the results could have been different.

Their self-esteem could have also been affected by their social support and illness adaptation. All participants (n = 10) mentioned that their mother was a perceived source of support and all participants had more than one source of support. In addition, the average onset of illness was 8.74 years (SD = 4.11, range 1.4-13 years). Coping mechanisms should also be considered.

Another participant had high self-esteem (28, range 13-29) despite having complications from her diabetes, eye and kidney changes, and was diagnosed with another illness (celiac disease). This finding was consistent with other studies that suggest self-esteem is not affected by chronic illness (Cavusoglu, 2001; Erkolahti et al., 2003; Ireys et al., 1994). It is unknown if the other participants had a secondary illness or experienced
peer acceptance was defined as "they used to make fun of me." A diabetic girl who may need an insulin pump to effectively manage her diabetes may be reluctant to use the insulin pump if she has body image disturbances and fear of peer acceptance.

Lastly, it was noted that despite offering an incentive, another $10.00 gift card for referrals, three out of ten girls (30%) commented, "that is not something I talk about with my friends." This data is consistent with the study done by Dunning (1995), which found that 10% of the sample population would disclose their diabetes information with another diabetic and 5% would not discuss it with anyone at all.

Recommendations

There are several significant limitations of the findings in this research study. The sample size was small and participants were specifically delineated, thus limiting the external validity of the results. It is not possible to generalize the findings or make conclusions to the general adolescent population. The small sample size provided a weak correlation between self-esteem and HgA1c. Perhaps if there was a larger sample, it may show
a stronger correlation and be statistically significant. In order to obtain greater external validity, it is recommended that a larger sample size of adolescent girls be studied to determine the relationship between socio-demographic information and self-esteem, to HgA1c. By expanding the sample size, perhaps knowledge associated with self-esteem and HgA1c could be better explained, leading to specific interventions.

**Recruitment of Participants**

It was very difficult to obtain participants. A recommendation would be develop a collaborative partnership with a school district and/or diabetes clinic and obtain written approval to work with them. It was identified that some school nurses were reluctant to assist with recruitment efforts because of “legalities,” despite the study had been approved by the Institutional Review Board at California State University, San Bernardino.

Confidentiality remained an important aspect with recruitment. The Health Insurance Portability and Accountability Act (HIPAA) - 1996 protects the privacy of health care information and all healthcare providers must
comply with HIPAA. Another aspect to consider was age. The sample size consisted of minors and they needed their parent/guardian consent. Hence, if the adolescent wanted to participate but the guardian/parent would not give consent, then the adolescent could not participate.

Implications for Practice

It is imperative to advance the practice of nursing and incorporate nursing research into practice. By exploring the phenomena of self-esteem in relation to glycemic control, the advanced practice nurse can then formulate interventions consistent with enhancement of self-esteem, develop fostering adolescent diabetic support groups, and assist the adolescent diabetic girl through the chronic illness consistent with her developmental stage and psychosocial considerations.

There is a persistent importance placed on attainment of technical skills; however, the medical team also needs to take into consideration the adolescent’s psychosocial well-being. The adolescent is experiencing rapid growth, hormonal changes, and the need for social attachment. Having a chronic illness is an emotional barrier. Type 1 diabetic girls need to have insulin shots
for the rest of their lives. Body image perception and peer acceptance are significant areas of concern for the adolescent girl. Special attention needs to be focused on adolescent girls with type 1 diabetes mellitus since they are at risk for having low self-esteem and adjustment problems, which can contribute to poor glycemic control.
APPENDIX A

RESEARCH STUDY DATA COLLECTION TOOL
“The Relationship between Self-Esteem and Glycemic Control in 13-17 year old Adolescent Girls with Type I Diabetes Mellitus”

Tell me about yourself by filling in the lines or circling the letter:

1. Your age now __________________

2. The age when you got diabetes __________________

3. The number of people you live with, including yourself __________________

4. The number of brothers ____________ or sisters ____________

5. The school grade you are in __________________

6. Circle the letter of your ethnicity:
   A. Caucasian
   B. African-American
   C. Asian/Pacific Islander
   D. Hispanic/Latino
   E. Native American-Indian
   F. Other __________________

7. Circle the letter that shows how much money do your parent(s)/guardian(s) make a year.
   A. < $10,000
   B. $10,000 - $20,000
   C. $30,000 - $40,000
   D. $50,000 - $60,000
   E. >$60,000
   F. I do not know

8. Circle the letter of all those people who help you with your diabetes:
   A. Mom
   B. Dad
   C. Brother(s)
   D. Sister(s)
   E. Friend(s)
   F. Grandparent(s)
   G. Aunt/Uncle
   H. Guardian
   I. Nobody
   J. Other __________________
"La Relación entre el Amor Propio y el Control de la Glucosa de Niñas Adolescentes de edad 13-17 años con el Tipo 1 Diabetes Mellitus"

Dime algo de usted. Llena las líneas o circula la letra.

1. Tu edad ahora ________________________
2. La edad cuando obtengo la diabetes ________________
3. El número de personas con que tu vives, incluyendo tu mismo ________________
4. El número de hermanos _________________ o hermanas _________________
5. Tu grado escolar __________________________
6. Circula la letra de tu ethncidad:
   A. Americano
   B. Africano-Americano
   C. Asiático/Islandero Pacífico
   D. Hispano/Latino
   E. Americano Nativo/Indio
   F. Otro ______________________
7. Circula la letra que estima cuanto dinero su padre(s)/guardian hace al año
   A. <$10,000
   B. $10,000-$20,000
   C. $30,000-$40,000
   D. $50,000-$60,000
   E. >$60,000
8. Circula la letra de esas personas que te ayudan con tu diabetes
   A. Madre
   B. Padre
   C. Hermano(s)
   D. Hermana(s)
   E. Amigo(s)
   F. Abuelo(s)
   G. Tía/Tío
   H. Guardian
   I. Nadie
   J. Otro ______________________
APPENDIX B

ROSENBERG SELF-ESTEEM SCALE (1965)
Rosenberg’s Self-Esteem Scale (1965)

Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I feel that I am a person of worth, at least on an equal plane with others.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>2. I feel that I have a number of good qualities.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>3. All in all, I am inclined to feel that I am a failure.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>4. I am able to do things as well as most other people.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>5. I feel I do not have much to be proud of.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>6. I take a positive attitude toward myself.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>7. On the whole, I am satisfied with myself.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>8. I wish I could have more respect for myself.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>9. I certainly feel useless at times.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>10. At times I think I am no good at all.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
</tbody>
</table>
La Escala Del Amor Propio De Rosenberg (1965)

Abajo hay una lista de características relacionadas con la forma en que usted se siente acerca de usted misma. Si usted esta fuertemente de acuerdo circule SA, si estad de acuerdo circule A. Si esta desacuerdo, circule D. Si esta fuertemente desacuerdo, circule SD.

<table>
<thead>
<tr>
<th>Frase</th>
<th>Fuertemente de acuerdo</th>
<th>Acuerdo</th>
<th>Desacuerdo</th>
<th>Fuertamente desacuerdo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Siento que soy una persona valiosa que estás al mismo nivel de los demás.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>2. Siento que tengo muchas buenas cualidades.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>3. Siento que soy un fracaso.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>4. Soy capaz de hacer las cosas tan bien como los demás.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>5. Siento que no tengo mucho cualidades de las cuales sentirme muy orgullosa.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>6. Tomo una actitud positiva sobre mi persona.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>7. Sobre todo estoy satisfecha conmigo misma.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>8. Quisiera tener más respeto conmigo misma.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>9. Me siento inútil a veces.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
<tr>
<td>10. A veces siento que no soy buena para nada.</td>
<td>SA</td>
<td>A</td>
<td>D</td>
<td>SD</td>
</tr>
</tbody>
</table>
APPENDIX C

PERMISSION LETTER
The Morris Rosenberg Foundation  
c/o Department of Sociology  
University of Maryland

Dear Morris Rosenberg Foundation,

I am a graduate nursing student at California State University San Bernardino. I am conducting a study for my Master's thesis entitled “The Relationship between Self-esteem and Glycemic Control in 13-17 year old Adolescents Girls with Type 1 Diabetes Mellitus” under the supervision of Dr. Ellen Daroszewski, nursing Professor at California State University San Bernardino. I am writing to you to inform you that I will be using the Rosenberg Self-esteem Scale to measure self-esteem in my thesis.

If you have any questions or concerns, please feel free to contact me or Dr. Ellen Daroszewski at (909) 880-7238.

Thank you,

Annabelle Sandoval, RN BSN  
15508 Via Paloma St  
Hesperia, CA 92345  
(760) 242-2311 ext. 5400  
aluciasand@aol.com
APPENDIX D

CERTIFICATE OF TRAINING FOR

THE CHOLESTECH GDX SYSTEM
Certificate of Training

for the Cholestech GDX™ System

Annabelle Sandoval Esparza

has completed a training program on the operation of the Cholestech GDX System.

Date: June 1, 2005

Trainee's Signature

Cholestech GDX

CHOLESTECH

FRM 12568A Rev. A
APPENDIX E

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER
March 19, 2004

Ms. Annabell Sandoval
c/o: Prof. Ellen Daroszewski
Department of Nursing
California State University
5500 University Parkway
San Bernardino, California 92407

Dear Ms. Sandoval:

Your application to use human subjects, titled, “The Relationship Between Self-Esteem and Glycemic Control in 13-17 Year Old Girls with Type I Diabetes Mellitus” has been reviewed and approved by the Institutional Review Board (IRB). Your informed consent document is attached. This consent document has been stamped and signed by the IRB chairperson. All subsequent copies used must be this officially approved version. A change in your informed consent requires resubmission of your protocol as amended.

You are required to notify the IRB if any substantive changes are made in your research prospectus/protocol, if any unanticipated adverse events are experienced by subjects during your research, and when your project has ended. If your project lasts longer than one year, you (the investigator/researcher) are required to notify the IRB by email or correspondence of Notice of Project Ending or Request for Continuation at the end of each year. Failure to notify the IRB of the above may result in disciplinary action. You are required to keep copies of the informed consent forms and data for at least three years.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, IRB Secretary. Mr. Gillespie can be reached by phone at (909) 880-5027, by fax at (909) 880-7028, or by email at mgillesp@csusb.edu. Please include your application identification number (above) in all correspondence.

Best of luck with your research.

Sincerely,

Joseph Lovett, Chair
Institutional Review Board

JL/mg

cc: Prof. Ellen Daroszewski, Department of Nursing
APPENDIX F

STUDY FLYERS
ATTENTION

Participation is needed for a study called “The Relationship between Self-Esteem and Glycemic Control in 13-17 year old Adolescent Girls with Type I Diabetes Mellitus.”

In order to qualify, you must be an adolescent girl between the age of 13-17 with Type I Diabetes Mellitus living in the Inland Empire.

The reason for doing this study is to collect information on how you feel and compare it to how well your diabetes is under control.

Before starting, your parent/guardian must fill out the consent form stating that it is okay for you to participate and then you will be asked to bring the signed consent when we meet. Then you will be asked in person if it is okay for you to participate.

You will be asked to answer questions about yourself and family life, fill out a self-esteem scale, and have a drop of blood taken from a prick of a finger, like when you poke yourself at home to check your sugar. This will take 15-20 minutes to finish in a private place at a location agreed upon by you and the researcher. At the end you will get the results from your blood poke and self-esteem scale and you will be able to pick out a self-care item of your choice as a thank-you. There are no risks involved.

If interested, please call Pat Owens at (909) 880-7627
e-mail: powens@csusb.edu
Thank You
Participacion es necesario para un estudio titulado “La Relacion entre el Amor Propio y el Control de la Glucosa de Ninas Adolescentes de edad 13-17 anos con el Tipo I Diabetes Mellitus.”

Para calificar necesitas ser una nina adolescente entre la edad de 13-17 anos con el Tipo I Diabetes Mellitus viviendo en el Inland Empire.

El propuesto de este estudio es para coleccionar informacion a serca de como tu te sientes y compararlo con el control de su diabetes.

Antes de comenzar su padre/guardian necesita llenar la forma de consentimiento que da permiso que usted participe. Es necesario traer el consentimiento cuando nos encontremos. Después en persona le voy a preguntar a usted si desea participar.

En este estudio va a responder a varias preguntas sobre si misma y su situacion familiar, llenaras una escala sobre el amor propio, y le tomare una gota de sangre del dedo que es similar a cuando te tomas la azucar en la casa. Tomara 15-20 minutos de completer en un lugar privado en un local de acuerdo con usted y la investigadora. Al final, recibira los resultados de la gota de sangre y la escala sobre el amor propio. Después sera invitada de escoger un articulo de bano para quidado propio de su selecto come gratitud. No hay riesgos.

Si interesada, llame a Pat Owens al numero (909) 880-7627
Por corero electronico: powens@csusb.edu

Muchas Gracias.
APPENDIX G

PARENTAL/GUARDIAN CONSENT
Dear Parent/Guardian,

Your child has been invited to participate in a study titled, "The Relationship between Self-Esteem and Glycemic Control in 13-17 year old Adolescent Girls with Type 1 Diabetes Mellitus." The purpose of the study is to collect information regarding how your child feels about herself and compare it to how well her diabetes is under control. This study is being conducted by Annabelle Sandoval RN, a graduate nursing student, under the supervision of Dr. Ellen Daroszewski, Professor in the Department of Nursing, at California State University, San Bernardino. This study has been approved by the Institutional Review Board at California State University San Bernardino.

In this study, your child will be asked to respond to several questions about themselves and their family living situation, fill out a short self-esteem scale, and have a drop of blood taken from a prick of a finger to measure their HgA1c to check how well their diabetes is under control, similar to when they check their blood sugar at home. All this should take about 15-20 minutes to complete. Privacy will be provided for the completion of the questionnaire and finger prick. All of the responses will be held in the strictest of confidence by the researchers. Your child's name will not be reported with her responses. All data will be reported in group form only. Your child can receive the group results of this study upon completion in August 2004 in the Pfau library at California State University San Bernardino, or by contacting Dr. Daroszewski at (909) 880-7238.

Your child's participation in this study is totally voluntary. Your child is free not to answer any questions and withdraw at any time during this study. When your child has completed the questions and finger stick, she will receive, a copy of the result of her finger stick, her HgA1c level, and be invited to pick a self-care toiletry item of her choice from a gift basket as a thank-you. We ask that your child not discuss this study with others.

There are no foreseeable risks involved. It may be of benefit to you, your child, or her health care provider to know her HgA1c level. We encourage you to share this information with her health care provider. Also, if your child is not feeling good about herself, as measured by the questionnaire, we will encourage her talk to a counselor at her school or share this information with her health care provider. If you or your child need to speak to someone regarding this study, have any concerns, or feel worried, please feel free to contact Dr. Ellen Daroszewski at (909) 880-7238.

By signing I acknowledge that I have been informed of, and that I understand the nature and purpose of this study and I give consent that my child may participate.

Parent/Guardian signature _____________________________ Date _____________________________

Print child's name _____________________________

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Estimado padre/guardian,

Su hija ha sido solicitada para participar en un estudio titulado "La Relacion entre el Amor Propio y el Control de la Glucosa de Niñas Adolescentes de edad 13-17 años con el Tipo 1 Diabetes Mellitus." El propósito de este estudio es para coleccionar información a serca de como su hija se siente sobre ella misma y compararlo con el control de su diabetes. Este estudio está conducido por Annabelle Sandova, una graduada estudiante de enfermería, con la supervisión de la Dra. Ellen Daroszewski, profesora de enfermería de la universidad de California de San Bernardino. Este estudio ha sido aprobado por la junta de la institucion de repaso de la universidad del estado de California, San Bernardino.

En este estudio su hija va a responder a varias preguntas sobre ella misma y su situación familiar, llenar una escala sobre el amor propio, y le tomare una gota de sangre del dedo que es similar a cuando ella se verifica la azucar en su casa para medir su HgA1c que indice el control de su glucosa. Todo tomara aproximadamente 15-20 minutos de completar. Privacidad sera proporcionada para completar las preguntas y gota de sangre. Todas las respuestas serán guardadas en estricto confidencia por los investigadores. El nombre de su hija no sera reportada con sus respuestas. Todo el dato sera reportada en forma de grupo. Su hija puede recibir los resultados del grupo en Agosto de este año cuando este completo en la biblioteca Pâu de la universidad del estado de California, San Bernardino o puede contactar a la Dra. Ellen Daroszewski al numero (909) 880-7238.

La participación de su hija es voluntaria. Su hija esta libre de no contestar cualquier pregunta y retirarse a cualquier momento durante el estudio. Cuando su hija a completado las preguntas y la gota de sangre del dedo, ella recibira una copia de lo resultados de la gota de sangre del dedo, el HgA1c que indice el control de su glucosa, y sera invitada a escoger un articulo de bano para quidado propio de su selecto de la canasta de regalo para dar gracias. Para asegurar la validad del estudio le pedimos que su hija no descute este estudio con otro participantes.

No se prevé que haiga riesgos. Puede ser de beneficio para usted, su hija, o el doctor de su hija saber los resultados de su HgA1c. Le animamos que comparte esta informacion con su provador de atencion medica. Si acaso su hija no se siente bien de si misma, por medida del cuestionario, le vamos a animar que ella hable con su consejero de su escuela o que comparte esa informacion con su provador de atencion medica. Si usted o su hija necesitan hablar con alguien en repuesta de este estudio, tiene inquietud, o se siente preocupado, por favor pongase en contacto con la Dra. Ellen Daroszewski al numero (909) 880-7238.

Al firmar yo admito que he sido informado de y entiendo el propósito de este estudio y doy libremente el consentimiento que mi hija participe.

La firma del padre/guardian

Fecha

El nombre de su hija

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CALIFORNIA STATE UNIVERSITY, SAN BERNARDINO INSTITUTIONAL REVIEW BOARD COMMITTEE
APPROVED 03/19/05 VOID AFTER 03/19/06

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APPENDIX H

CHILD ASSENT
Dear Participant,

You are being invited to participate in a study called "The Relationship between Self-esteem and Glycemic Control in 13-17 year old Adolescent Girls with Type 1 Diabetes Mellitus." The reason for doing this study is to collect information about how you feel about yourself and compare it to how well your blood sugar is under control. This study is being done by Annabelle Sandoval RN, graduate nursing student, under the supervision of Dr. Ellen Daroszewski, Professor in the Department of Nursing at California State University San Bernardino. This study has been approved by the Institutional Review Board at California State University San Bernardino.

You will be asked to answer questions about yourself and your family life, fill out a self-esteem scale, and have a drop of blood taken from a prick of a finger, like when you poke yourself at home to check your sugar. This should take about 15-20 minutes to finish in a private. All of your answers will be placed in a safe place. Your name will not be used with your answers. The information will be talked about in group form only. You can get the group results from the study when it is done in August of this year Pfau library at California State University San Bernardino, or by calling Dr. Ellen Daroszewski at (909) 880-7238

Your participation in this study is voluntary. You do not have to answer any question which you do not want to answer and you can leave at anytime without any problems. When you are done with the questions and finger prick, you will be given a copy of the finger prick results and you will be able to pick a small self-care gift from the gift basket of your choice as a thank-you. In order for the study to be very good please do not talk about it with other people.

There are no foreseeable risks involved. It may be helpful to share your finger prick results with your parent or guardian, or your doctor. If you are not feeling good about yourself, as measured by the questionnaire, we will encourage you to talk to a counselor at your school or to share this information with your health care provider. If you need to speak to someone about this study, have concerns, or worries, please call Dr. Ellen Daroszewski at (909) 880-7238.
Estimada participante,

Usted ha sido solicitada para participar en un estudio titulado “La Relacion entre el Amor Propio y el Control de la Glucosa de Ninas Adolescentes de edad 13-17 anos con el Tipo 1 Diabetes Mellitus.” El propósito de este estudio es para coleccionar información a cerca de como tu te sientes y compararlo con el control de su diabetes. Este estudio esta conducido por Annabelle Sandoval, un graduado estudiante de enfermeria, con la supervision de la Dra. Ellen Daroszewski, profesora de la universidad del estado de California de San Bernardino. Este estudio ha sido aprobado por la junta de la institucion de repaso de la universidad del estado de California, San Bernardino.

En este estudio vas a responder a varias preguntas sobre si misma y su situacion familiar, llenarás un escala sobre el amor propio, y le tomaremos una gota de sangre del dedo que es similar a cuando te tomas la azucar en casa. Todo tomará aproximadamente 15-20 minutos de completar. Privacidad sera proporcionada. Todas las repuestas seran guardadas en lugar seguro. Su nombre no sera reportada con sus repuestas. Todo el dato sera reportada en forma de grupo. Usted puedo cojer los resultados del grupo del estudio en Agosto de este ano cuando este completo en la biblioteca Piua de la universidad del estado de California, San Bernardino, o puede contactar a la Dra. Ellen Daroszewski al numero (909) 880-7238.

Su participacion es completamente voluntaria. Usted esta libre de no contestar cualquier pregunta y retirarse a cualquier momento durante el estudio. Cuando ha terminado de completar las preguntas y la gota de sangre del dedo, usted recibira una copia de el resultado de la gota de sangre del dedo y sera invitada de escojer un articulo de bano para quidado propio de su selecto de la canasta de regalo para dar gracias. Para asegurar la validad de este estudio le pedimos que no descute este estudio con otro participantes.

No se prevere que haiga riesgos. Seria servicial si comparta los resultados de la gota de sangre con sus padre(s)/guardian o doctor. Si no te sientes bien de si misma por medido del cuestionario, te voy animar que hables con tu consejero de tu escuela o que compartes esa informacion con tu provador de atencion medica. Si necesitas hablar con alguien en repuesta de este estudio, tiene inquietud, o se siente preocupada por favor pongase en contacto con la Dra. Ellen Daroszewski al numero (909) 880-7238.
REFERENCES


