

California State University, San Bernardino

CSUSB ScholarWorks

Theses Digitization Project

John M. Pfau Library

2003

Depression and diabetes in adolescents

Leanne Marie Graff

Karin Yakira

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/etd-project>



Part of the [Social Work Commons](#)

Recommended Citation

Graff, Leanne Marie and Yakira, Karin, "Depression and diabetes in adolescents" (2003). *Theses Digitization Project*. 2278.

<https://scholarworks.lib.csusb.edu/etd-project/2278>

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

DEPRESSION AND DIABETES IN ADOLESCENTS

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

In Partial Fulfillment
of the Requirements for the Degree
Master of Social Work


by
Leanne Marie Graff
Karin Yakira
June 2003

DEPRESSION AND DIABETES IN ADOLESCENTS

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

By
Leanne Marie Graff
Karin Yakira
June 2003


Approved by:




Dr. Laurie Smith, Faculty Supervisor
Social Work

May 03

Date



Dr. Matt Riggs, Primary Investigator
Loma Linda University



Dr. Rosemary McCaslin,
M.S.W. Research Coordinator

ABSTRACT

The purpose of this study was to examine whether type of diabetes, glucose control or length of diagnosis affected depression levels in adolescents with diabetes. Forty-six adolescents, aged 12-18, responded to a questionnaire inclusive of the Center for Epidemiological Studies Depression Scale for Children and demographic information, such as type of diabetes, age, year of diagnosis, and ethnicity. Although there were no statistically significant associations between depression levels at the .05 level, type of diabetes, glucose control and length of diagnosis, the average score for adolescents with type 1 diabetes did not indicate depression, while the average score for adolescents with type 2 did. As predicted, the rate of depression in the diabetic adolescent population was higher than the rate for the general adolescent population. These findings indicate that depression among adolescent diabetics is a major mental health concern and should continue to be studied.

ACKNOWLEDGMENTS

A work that takes this much time is the product of the support, guidance, endurance and inspiration of many individuals. Dr. Rosemary McCaslin's enthusiasm and excitement about research was inspiring and contagious. Thank you for your confidence and support in helping us begin and complete this project.

To Dr. Laurie Smith, our research advisor. Thank you for your on-going patience and support. We truly appreciate the open door you always had for us.

To the diabetes specialty team at Loma Linda University Medical Center. Thank you for your genuine interest in our study. Your dedication to working with children living with diabetes has been inspiring.

To Dr. Matt Riggs, our primary investigator at Loma Linda University. Thank you for taking us under your wing and for your continuous support and encouragement, both with this project and with the Loma Linda IRB process.

First and foremost, I would like to thank God for HIS continuous love and support (I CAN do ALL things through Christ who strengthens me - Philippians 4:13).

To Ginno, who is so much more than just my husband. To my knight in shining armor, my best friend, and my

better half. Thank you for the laughter, the love, and for your continuous encouragement.

To my mom and dad, for all your love and support as I have struggled to determine what to do with my future. Thank you for always encouraging me to be all that I can be. You have inspired me more than you will ever know.

To Stephanie, Nicole, and Adam - my beautiful siblings. Each of you has inspired me in different ways. I love you forever, I like you for always, as long as I'm living, my babies you'll be..

To Leanne, my research partner, and more importantly, my friend. Thank you for your hard work, your intelligence, and your persevering spirit. You will be my role model forever.

Thank you, mom and dad, for your guidance, love and support through all the years, especially during the years of illness and hospitalizations. More importantly, for your encouragement and support during these past four years as I pursued my dream of higher education.

To Judy, my mentor and role model, you were my inspiration in pursuing my dream. Thank you for your support, encouragement, and editorial advising during the past four years. More importantly, thank you for planting

the seed. I only hope that I will be half the social worker that you are.

To Karin, my research partner, friend and little sister. We made a great team. I knew I paired up with the best when I paired up with you. Thank you for putting up with my anxiety and stress during this project and for also sharing in the laughter (the printer that sends love notes!) Remember, never let your diabetes prevent you from fulfilling your dreams.

DEDICATION

This research project is dedicated to the millions of adolescents who live with diabetes and in particular, to the participants who chose to be a part of our study and whom continuously inspired us with their strength.

"Although the challenges of living with diabetes seem to increase the risks of depression, many individuals have positive experiences. Often times these experiences reflect an increased capacity for self-awareness, self-confidence, faith and humor" (Peyrot & Rubin, 2001, p. 474). May you continue to strive to live well with diabetes.

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGMENTS	iv
LIST OF TABLES	ix
CHAPTER ONE: INTRODUCTION	
Problem Statement	1
Purpose of the Study	3
Significance of the Project for Social Work	5
CHAPTER TWO LITERATURE REVIEW	
Adolescence	9
Depression	10
Diabetes and Depression	12
Depression in Adolescents with Diabetes	15
Theories Guiding Conceptualization	18
Summary	20
CHAPTER THREE: METHOD	
Introduction	21
Study Design	21
Sampling	23
Data Collection and Instruments	24
Procedures	27
Protection of Human Subjects	28
Data Analysis	30
Summary	32

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGMENTS	v
LIST OF TABLES	ix
CHAPTER ONE: INTRODUCTION	
Problem Statement	1
Purpose of the Study	3
Significance of the Project for Social Work	5
CHAPTER TWO: LITERATURE REVIEW	
Adolescence	9
Depression	10
Diabetes and Depression	12
Depression in Adolescents with Diabetes	15
Theories Guiding Conceptualization	18
Summary	20
CHAPTER THREE: METHOD	
Introduction	22
Study Design	22
Sampling	24
Data Collection and Instruments	25
Procedures	28
Protection of Human Subjects	29
Data Analysis	30
Summary	32

CHAPTER FOUR: RESULTS	33
Presentation of the Findings	36
Summary	38
CHAPTER FIVE: DISCUSSION	
Introduction	40
Discussion	40
Limitations	46
Recommendations for Social Work Practice, Policy and Research	48
Implications for Social Work Practice	48
Policy	50
Future Research	51
Conclusions	52
APPENDIX A: CENTER FOR EPIDEMIOLOGICAL STUDIES DEPRESSION SCALE FOR CHILDREN	54
APPENDIX B: PARTICIPANT INFORMATION	57
APPENDIX C: CODED FACE SHEET	59
APPENDIX D: INFORMED CONSENT	61
APPENDIX E: INSTITUTIONAL REVIEW BOARD LOMA LINDA UNIVERSITY	65
REFERENCES	68
ASSIGNED RESPONSIBILITIES PAGE	72

LIST OF TABLES

Table 1. Demographic Variables of Diabetic Adolescents (n = 46)	34
Table 2. Independent Samples t-Test Comparing Type of Diabetes with Total Depression Score (n = 46)	36
Table 3. Pearson Correlation between Depression, Glucose Control and Length of Diagnosis (n = 46)	37

CHAPTER ONE

INTRODUCTION

Problem Statement

Diabetes is a chronic disease that affects over sixteen million people living in this country, which translates to approximately 6% of the United States population (American Diabetes Association, 1996). According to the Juvenile Diabetes Research Foundation (2003), it is estimated that the incidence rates of type 1 diabetes have increased more than 10 fold between 1900-2000, with the sharpest rise being seen since 1950. There are approximately 1.1 million individuals with type 1 diabetes in the United States today. Type 1 diabetes occurs when the pancreas no longer produces insulin resulting in interference with the metabolic process of converting food into glucose and of fueling energy (American Diabetes Association, 1996). Type 2 diabetes differs from type 1 in that the pancreas does produce insulin but is unable to utilize it properly (American Diabetes Association, 1996).

Although those with diabetes can live a relatively normal life, the individual must take responsibility for regulation of blood sugar levels, which the body

automatically regulates in those without diabetes. This responsibility entails a complicated, multi-component regimen which differs based on the type of diabetes (Skinner & Hampson, 1998). A normal treatment plan for type 1 diabetes consists of a well-balanced diet, exercise, monitoring of blood glucose levels four to six times a day and several insulin injections daily. In regard to type 2 diabetes, a recommended treatment plan entails a well-balanced diet, exercise, daily blood glucose monitoring, oral medications, and in some cases insulin (American Diabetes Association, 1996).

As children living with diabetes reach adolescence, they are expected to take increasing responsibility for the management of their disease (Grey, Davidson, Boland, & Tamborlane, 2001). When diabetes is combined with the life stage of adolescence when peer pressure, independence and invulnerability are at their peak, compliance and diabetes control often deteriorate (Grey et al., 2001). As diabetes control deteriorates, depression often becomes prevalent. Likewise, as depression worsens, diabetes control worsens. Thus, a cycle of uncontrolled diabetes and depression is created, especially if unrecognized and untreated.

The specific problem this study addressed is the degree of depression in adolescents who live with

diabetes, both type 1 and type 2, and the associations between that depression and glycemic control, length of diagnosis, type of diabetes, ethnicity, and gender.

Purpose of the Study

The purpose of this study was to empirically examine the levels of depression in adolescents with diabetes. The specific hypotheses are: 1) that adolescents with type 1 will have higher levels of depression than those with type 2; 2) a positive association will exist between poor glucose control and levels of depression; 3) a positive association will be present between length of diagnosis and depression with those who have lived with diabetes longer having higher depression scores; 4) adolescents with diabetes will have higher rates of depression than the general adolescent population.

If this study's hypotheses are proven, the need for more social work involvement in the diabetes setting will be supported. "Social workers are ideally suited to develop and teach the psychosocial component of a diabetes program" (DeCostar, 2001, p. 28). The social worker, working in collaboration with the medical team, can identify those at highest risk for depression by looking at blood sugar control, type of diabetes, and how long an

individual has lived with diabetes. The social worker can then design and implement an intervention and/or prevention program, as well as identify and assess those with depression. With regular involvement of mental health professionals in treating adolescents with diabetes, compliance issues may be easier to assess and treat, by assessing and treating the underlying depression.

This research focused on the dependent variable of depression, while looking at the independent variables of type of diabetes, glucose control, length of diabetes diagnosis, gender, age and ethnicity. The purpose of examining these particular variables was to ascertain whether type of diabetes is associated with depression levels and whether glucose control and length of diagnosis, have a positive association with depression in adolescents.

Because the daily management of diabetes is so demanding and is left up to the individual, type of diabetes as well as length of diabetes diagnosis are important variables. Those with type 1 diabetes have a more rigorous and more involved treatment plan in comparison to those with type 2. Likewise, the longer an individual has lived with diabetes the longer they have had to handle the demanding daily management of the

disease. This daily management has also intruded on every part of their life for a much longer time (Skinner & Hampson, 1998).

Significance of the Project for Social Work

As Mayden and Nieves point out, two of the three purposes of social work in the health care setting are "to help individuals and families to function when illness, disease, or disability results in changes to their physical state, mental state, or social roles and to prevent social and emotional problems from interfering with physical and mental health or with needed treatment" (2000, p. 148).

Social workers focus on the range of emotional, social, and environmental problems of individuals. Consequently, they are the most appropriate health professionals to consider the type and severity of psychosocial problems that may interfere with compliance and medical treatment (Mayden & Nieves, 2000). As Bergman, Akin, and Felig (1988) point out, regularly inquiring about the emotional welfare of patients demonstrates concern for them as individuals apart from their medical needs.

In this day and age of managed care, one sees providers spending less and less time with patients and seeing more and more patients in one day. As most managed care operates under a medical model, rather than the biopsychosocial model of social work, "most managed care programs fail to provide a comprehensive range of needed services" (Mayden & Nieves, 2000, p. 215). In fact, researchers (Leedom, Meehan, Procci, & Zeidler, 1991; Lustman & Harper, 1987) have found that physicians have been poor at identifying patients in need of mental health services.

Deterioration of diabetes control during adolescence has been documented in the literature (Grey et al., 2001; Skinner & Hampson, 1998; Anderson et al., 1990; Johnson et al., 1992; Morris et al., 1997). The prevalence of depression in the adolescent diabetes population has also been documented as well (Mahon & Yarcheski, 2001; Skinner & Hampson, 1998; Helz & Templeton, 1990; Eaton, et al., 1992; Kovacs, et al., 1997; Jacobson et al., 1997). These studies have shown that "an accurate understanding of emotions, such as depression, during adolescence is an important component of developing effective health promotion interventions" (Mahon & Yarcheski, 2001, p. 361).

The implications for social work, then, are two fold:

- 1) to advocate for diabetes patients and their right to quality health care, both mental and physical, by incorporating an interdisciplinary team approach, which includes social work; and 2) to view diabetes patients from a holistic perspective integrating, treating, and preventing, the social, environmental, and psychological factors that interfere with proper management of a chronic condition like diabetes.

The patient and family who live with diabetes have many psychosocial issues with which to deal. These may include their expectations, attitudes, and goals for treatment; their grief and acceptance of the diagnosis; extent and sources of current stress; emotional reactions to key issues of diabetes care such as injections, diet, fear of complications, and fear of hypoglycemia; financial issues especially those related to insurance coverage; reactions to and relationships with members of the health care team; and readiness to learn and make behavioral changes (Jacobson, 1996). Perhaps this research will help the medical profession realize the importance of and need for social workers as part of the team approach in treating adolescents with diabetes. While the medical team is not trained and does not have the time to assess

psychosocial problems, the social worker has the training to complete such an assessment. With a social worker on the team who is able to assess for, help prevent, or intervene early in treating depression, noncompliance issues with adolescents and the depression they suffer, should decrease.

CHAPTER TWO

LITERATURE REVIEW

This chapter will focus on various literature supporting the need to study the association between depression and diabetes in adolescents. Unless specified as type 1 or type 2, whenever diabetes is mentioned in this study, it refers to both type 1 and type 2 diabetes. The first section will discuss the developmental stage of adolescence and the primary areas of concern that accompany this stage. The second section will explain depression in the general population and in adolescents. The third section will discuss diabetes and depression among people of all ages. Tying these sections together, the fourth section will consider the role of depression in adolescents with type 1 diabetes versus adolescents with type 2 diabetes and the need for further research on this topic.

Adolescence

According to Erik Erikson's eight stages of development (as cited in Zastrow & Kirst-Ashman, 2001), adolescence is a time when young people explore who they are and establish their identity. This transitional period includes numerous developmental tasks that adolescents

must master. Among these tasks are adjusting to the physical changes of puberty, separating from their parents, developing a social network, focusing their educational and vocational objectives, and realizing and coming to terms with sexual orientation (Koplewicz, 2002). Adolescents are also often faced with increased stress, impulsivity, low self-esteem, and feelings of helplessness and hopelessness (Zastrow & Kirst-Ashman, 2001). Such factors are part of the reason that adolescents have higher depression rates than adults (Koplewicz, 2002).

Depression

Approximately 40 million Americans suffer from depression (Koplewicz, 2002). Within the general population, the lifetime risk for Major Depressive Disorder, as defined by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), is between 10%-15% for women and between 5%-12% for men (American Psychiatric Association [APA], 2000). The DSM-IV-TR defines a major depressive episode as follows,

Five or more of the following symptoms have been present and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

- (1) Depressed mood most of the day, nearly every day, as indicated by either subjective report or observation made by others.

- (2) Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day
- (3) Significant weight loss when not dieting or weight gain, or decrease in appetite nearly every day.
- (4) Insomnia or hypersomnia nearly every day
- (5) Psychomotor agitation or retardation, nearly every day
- (6) Fatigue or loss of energy nearly every day
- (7) Feelings of worthlessness or excessive or inappropriate guilt nearly every day
- (8) Diminished ability to think or concentrate, or indecisiveness, nearly every day
- (9) Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. (APA, 2000, p. 356)

Depression rates more than double for people suffering from chronic medical conditions. Approximately 20%-25% of individuals suffering from chronic medical conditions, like diabetes, will be diagnosed with Major Depressive Disorder (APA, 2000).

Among the 40 million Americans currently suffering from depression, approximately 3.5 million of them are children and teenagers (Koplewicz, 2002). When converted to a percentage of the adolescent population, rather than numbers, children and adolescents are shown to have higher rates of depression than the general population. In a given year, as many as 8.3% of the adolescent population will begin exhibiting signs of major depression, compared with only 5.3% for adults (Koplewicz, 2002).

There are key clinical characteristics that distinguish adolescent symptomology from that of adults. Adolescents who are depressed tend to exhibit more helplessness, despair, lack of pleasure, hypersomnia, and changes in weight (Koplewicz, 2002). Depressive episodes in adolescents also tend to be more episodic with stages of depression followed by better functioning (Koplewicz, 2002). Depression in adolescents may be associated with future substance abuse, unwed pregnancy, eating disorders, and violence (Koplewicz, 2002). In addition, studies show that adolescents tend to have higher rates of suicide attempts and higher rates of lethality in suicide attempts than adults (Mellin & Beamish, 2002).

Diabetes and Depression

Depression is three times more prevalent in people with diabetes than in the general population (Lustman, Griffith, & Clouse, 1996). "Diabetes is considered one of the most psychologically and behaviorally demanding of the chronic medical illnesses" (Ciechanowski, Katon, & Russo, 2000, p. 3279). Although depression is more prevalent in individuals with diabetes, it is unrecognized and untreated in more than two-thirds of cases (Lustman, Griffith, & Clouse, 1996).

An individual with diabetes who is also suffering from depression has different symptoms that may arise due to the fact that they have a chronic illness. Depression can intensify medical symptoms, promote poor glucose control, and increase the risk of diabetes complications (Lustman, Griffith, & Clouse, 1996). "Recognition of the association of lifetime and current depression with high HbA_{1c} values may be useful to guide clinicians toward more aggressive treatment of the underlying psychiatric conditions in order to affect diabetes self care" (DeGroot, Jacobson, Samson, & Welch, 1999, p. 433).

Leedom, Meehan, Procci, and Zeidler conducted a study that focused on depression in individuals with diabetes. Their sample consisted of 71 consecutive type 2 diabetic subjects and a non-diabetic control group. A non-diabetic control group. Using the Beck Depression Inventory and Zung Self-Rated Depression Scale, the study found that scores of type II diabetic patients were higher than those of patients in the control group. "In this group (type II diabetic patients), 74% of patients scored within the range of clinical depression on the BDI, 35% scored within the range of severe depression" (1991, p. 280). This study therefore showed that rates of depression are higher in individuals with diabetes versus those without. However,

this study focused entirely on individuals with type 2 diabetes, and did not look at depression in patients with type 1 diabetes.

In another study, researchers looked at the relationship between poor glucose control and depression in individuals with type 1 diabetes (Mazze, Lucido, & Shamoon, 1984). Eighty-four subjects between 13-41 years of age participated in this study. Findings indicated that subjects whose blood glucose was in good control during the study had significantly lower scores of depression on the Zung Self-Rated Depression Scale than those who had less control with their blood glucose levels. In addition, depression scores were found to increase with the worsening of glycemic control and to decrease with improvements in control. This study was effective in showing that poor glucose control is related to depression in individuals with type 1 diabetes.

A third study found a lifetime prevalence of major depression in 24% of the type 1 diabetics that they studied (Popkin, Callies, Lentz, Colon, & Sutherland, 1988), rating 10% higher than the lifetime prevalence of major depression in the general population (APA, 2000). The sample consisted of 75 candidates for pancreas transplantation and 34 potential donors. While conducting

their study, researchers found that the lifetime prevalence of major depression among those with diabetes could not be attributed to duration of diabetes or the presence of various diabetic complications.

Depression in Adolescents with Diabetes

Depression in young people often co-occurs with other mental disorders or physical illnesses, including diabetes (Kovacs, Goldston, Obrosky, & Drash, 1997). As previous studies have shown, individuals with diabetes have higher rates of depression than non-diabetics, and adolescents have higher rates of depression than adults (Koplewicz, 2002; Lustman, Griffith, & Clouse, 1996). However, sufficient data are missing on whether adolescents with type 1 diabetes are at higher risk for depression than adolescents with type 2 diabetes. Since type 1 and type 2 diabetes entail different treatment regimens, it is probable that there will be a difference in depression rates depending on the type of diabetes that the adolescent has.

Several research studies have focused on depression in adolescents with both type 1 and type 2 diabetes. Swift's research studied 50 juvenile diabetic patients and 50 control subjects and found "significantly more

psychopathology in the diabetic patients" (cited in Helz & Templeton, 1990, p. 1277). White's research included a retrospective study of 30 children and adolescents with unstable diabetes and concluded that most of the diabetes instability was due to emotional stress (cited in Helz & Templeton, 1990). Orr studied 15 adolescents with poorly controlled diabetes and found a high incidence of psychosocial problems, including depression (cited in Helz & Templeton, 1990, p. 1277). However, considering the small sample size the generalizability is questionable.

Another study conducted by Eaton, Mengel, Mengel, Larson, Campbell and Montague found that although there was not much evidence supporting an association between diabetes and depression in adults, an association could be made linking depression to adolescents with diabetes. The researchers evaluated psychological influences on management and control of insulin-dependent diabetes. One hundred and twenty-seven insulin-dependent patients ages 14 and up participated in this study. The researchers did not find an association between psychosocial variables and diabetes in adults, but did find some evidence showing a positive association between psychosocial variables and diabetes in insulin-dependent adolescents. "The conclusion is that there is no broad strong association of

psychosocial variables with blood sugar but there may be subgroups of individuals with diabetes, especially adolescents with recent onset, for whom the relationship may be more powerful" (1992, p. 115).

Kovacs, Goldston, Obrosky, and Bonar conducted a longitudinal study following 92 type 1 insulin-dependent youths over ten years. This study found that by the tenth year of diagnosis and the "mean age of 20 years, an estimated 46.7% of the sample developed a psychiatric disorder" (1997, p. 36). This study also found that major depressive, conduct, and generalized anxiety disorders were the most prevalent, and that major depression had a significantly higher estimated rate (27.5%) than each of the other disorders.

A longitudinal study conducted by Jacobson et al. (1997), found that adolescents with type 1 diabetes, as a group, did not exhibit any clear psychosocial problems stemming from having diabetes. However, the findings of this study are limited in application, for the majority of the sample population was Caucasian, reasonably well educated, and from a high socioeconomic stratum.

Theories Guiding Conceptualization

This study was guided by the biopsychosocial model in helping understand depression in adolescents with diabetes. The biopsychosocial model incorporates biological, psychological, and social information pertaining to the adolescent (Sands, 2001). The researchers anticipated that the biopsychosocial model could be used to further assess adolescents who scored a 16 or higher on the CES-DC scale. The information gathered through the use of such a comprehensive assessment could assist the social worker to better understand why an adolescent screened positive for depression.

Biological information is "obtained from the physician and the client's self-report" (Sands, 2001, p. 89). Since the adolescents were already being seen at a medical clinic, a social worker would have easier access to speaking to the clients' physician. It is recommended that the social worker assess the client's health by asking questions pertaining to the "client's nutrition, exercise, sleep, and substance use" (Sands, 2001, 89). At the diabetes clinic, the social worker would be able to obtain most of this information from the other members of the clinical team, as well as the patient and patients' family.

Psychological information includes emphasis on the "client's symptoms and reported results of psychological testing" (Sands, 2001, p. 92). In addition, the social worker would want to look at ways in which the adolescent might be vulnerable to mental health crises and to their strengths. An important area for social workers to seek information about with diabetic adolescents would be in regard to their coping mechanisms. Coping mechanisms are especially important because they "help individuals manage their feelings, prevent them from being overwhelmed, and empower them to do something" (Sands, 2001, p. 93). Assessing coping mechanisms could also assist the social worker to determine how the adolescent is coping with diabetes.

The last component of the biopsychosocial model is gathering social information from the adolescent. This would include gathering information about the client's culture, social environmental stressors and resources, family and other significant relationships (Sands, 2001). Especially relevant to adolescents, the social worker would also want to inquire into the client's education.

By using the biopsychosocial model to further assess depressed adolescents with diabetes, the social worker could gather information that would help understand how or

why the adolescent is depressed. The researchers' primary goal for the research project was to use a screening tool to assess for depression. However, the biopsychosocial model guided the researchers as to the types of variables that were looked at and was also the basis for providing referral information. A screening tool like the CES-DC is just the beginning step in assessing for depression. The biopsychosocial model provides the steps to follow next.

Summary

Although there are numerous studies focusing on depression in diabetic adults, data providing statistical information on the difference of rates of depression in type 1 versus type 2 diabetic adolescents is lacking. This study will take the next needed step of gathering data to show the prevalence rates of depression for the different types of diabetic adolescents. This study will also focus on how length of diagnosis and glucose control affect levels of depression in diabetic adolescents. Finally, using the biopsychosocial model, social workers will be better able to understand the dynamics surrounding an adolescent who has scored as depressed on the CES-DC scale.

CHAPTER THREE

METHOD

Introduction

The current study was interested in the associations between levels of depression and the several variables hypothesized to affect depression levels. More specifically, it analyzed the effects of type of diabetes, glucose control, and length of diagnosis on depression in adolescents. This chapter will describe the study's design, sampling criteria, data collection, instruments, and procedures that will be employed. This section will also go into detail on how participants' anonymity and confidentiality was preserved, as well as provide a basis for how the data was analyzed once it was collected.

Study Design

The purpose of this study was to determine if associations exist between the independent variables (type of diabetes, length of diabetes diagnosis, glucose control, gender, age and ethnicity) and the dependent variable (depression). A descriptive study was chosen, utilizing a convenience sample (Grinnell, 2001).

Participants were asked to fill out the Center for Epidemiological Studies Depression Scale for Children

(CES-DC) (Fendrich, Weissman, & Warner, 1990) [see Appendix A]. This self-report symptom scale is a twenty-item questionnaire in which each item is rated on a scale of zero (not at all) to three (a lot) in terms of frequency of occurrence during the past week, with total scores ranging from zero to sixty (Fendrich, Weissman, & Warner, 1990). At the end of the questionnaire, participants responded to demographic questions and questions related to diabetes management (see Appendix B). A separate coded face sheet was used by the researchers to access the respondent's last two HbA₁C levels, as well as their current blood sugar reading (see Appendix C).

This study had several hypotheses. First, it was hypothesized that differences in depression levels would be found between adolescents with type 1 and type 2 diabetes. Second, a positive association would exist between poor glucose control and depression. Third, a positive association would be present between length of diagnosis and depression with those who have lived with diabetes longer having higher depression scores. Finally, it was hypothesized that higher rates of depression would be found among adolescents with diabetes than the general adolescent population.

Although this study strived to produce results that could be generalized to all adolescents with diabetes, some limitations did exist. First, the sample was taken from one clinic setting in which treatment and care are homogeneous, limiting the generalizability of results to those who receive a lower level of care, or conversely, a higher standard of care. Second, the sample was drawn from those who are coming in for a clinic appointment so that those who may be severely depressed may be those who are not showing up for appointments. Third, the population this study assessed is approximately 80% low income and has medical coverage through Medi-Cal and California Children's Services (CCS), which may limit the generalizability of this study to other populations of diabetic adolescents (i.e., those with higher incomes, more adequate insurance, and more resources).

Sampling

Nonprobability sampling was used because the odds of any individual subject being selected who meets the criteria could not be estimated (Grinnell, 2001). Specifically, the type of nonprobability sampling that was used was convenience sampling with reliance being placed on the closest and most available participants to

constitute the sample. The researchers approached all diabetic patients between the ages of 12-18 who were seen at the diabetes clinic during the two-month period of data collection, between February and March of 2003. The resulting sample consisted of 46 diabetics between the ages of 12-18.

Data Collection and Instruments

Participants responded to a five-page questionnaire. The questionnaire packet consisted of an informed consent (see Appendix D), the CES-DC questionnaire containing twenty questions, and one page of demographics and health questions. The demographic and health questions addressed what type of diabetes the participant had, what year they were diagnosed as well as ethnicity, age and gender (see Appendix B).

The Center for Epidemiological Studies, Depression scale for Children (CES-DC) has demonstrated an overall alpha coefficient of .89 indicating excellent internal consistency reliability (Fendrich, Weissman, & Warner, 1990). According to Fendrich, Weissman, and Warner concurrent validity of the measure is supported to the extent that elevated scores on the CES-DC are associated

with current Diagnostic and Statistical Manual (DSM) diagnoses of major depressive disorder or dysthymia.

Validity of the measure as a screen for depression is also supported to the extent that elevated scores on the CES-DC are specific to criterion diagnosis. The results of a study conducted by Fendrich, Weissman, and Walker provide support for the reliability and validity of the CES-DC as a measure of depressive symptomology in children, adolescents and young adults. These results appear to be most valid as a measure of depression in females and in adolescents aged 12-18.

The CES-DC questionnaire's level of measurement is ordinal. Participants selected a responses from a 4-point Likert-type scale ranging from not at all (0) to a lot (3). The minimum possible score is zero and the maximum is sixty. Scores are obtained by reversing the scale for questions four, eight, twelve, and sixteen as these reflect positive experiences rather than negative ones (i.e., I was happy this week, I had a good time this week) and then summing all twenty questions, resulting in an interval level of measurement. A score of 16 or greater reflects that the individual may have experienced some depression during the past week.

The independent variables (glucose control, type of diabetes, length of diagnosis, gender, ethnicity, and age) have different levels of measurement. Glucose control was a continuous level of measurement and the researchers accessed the face sheet on the outside of the participant's medical chart for the last two glycosylated hemoglobin (HbA₁C) readings, as well as the current blood sugar reading.

The HbA₁C is a test that measures control during the past few months. This test measures the amount of sugar that attaches to protein in the red blood cells. Because red blood cells live for approximately three months, the HbA₁C test shows the average blood sugar during that time. The greater the amount of sugar in the blood, the higher the HbA₁C level. A generally accepted normal level is less than or equal to 8.1%, which indicates good control (ADA, 1996).

The ideal range for blood sugar readings is as close to the normal range as for those who do not have diabetes. This range is generally agreed to be between 70-120mg/dl.

Length of diagnosis was also measured on a continuous level, with participants responding to the question, "what year were you diagnosed with diabetes?" The researchers then converted the years to whole numbers ranging from

1-18. Type of diabetes was a nominal measure with participants circling which type of diabetes they had, type 1 or type 2.

Ethnicity was a nominal measure with participants circling the answer which best described them: Caucasian, African-American, Asian American, American Indian/Native American, Hispanic/Latino, or other. Gender was also a nominal measure as patients circled either male or female.

Procedures

Data was gathered at the out-patient pediatric diabetes clinic at Loma Linda University Medical Center by the researchers. The data collection process was begun by accessing the patient census list and determining which patients were between the ages of 12-18. A researcher approached eligible clients once they were in the examination room for the scheduled medical appointment. The researcher introduced herself, stated her position at the hospital and then described the study. The researcher provided the participant and the participant's parent/guardian with an informed consent to read and sign. The researcher had to obtain an informed consent (see Appendix D) from both the participant and their

parent/guardian before proceeding with the survey (see Appendice A-C).

The participant was then asked to accompany the researcher to a private room where they completed the questionnaire, while the participant's parent/guardian remained in the examining room. The questionnaire took approximately ten minutes to complete. When the participant finished completing the questionnaire they were sent back to the examining room. At this point, the current HbA₁C values and blood glucose levels of the participant were recorded by the researcher from the face sheet on the participant's medical chart. Forty-nine clients were approached for participation in the study, three refused to take part in the study, leaving a total of forty-six participants who agreed to take part.

Protection of Human Subjects

All human subjects that were sampled were protected in four ways. First, the researchers underwent a review process at the medical center and a full Institutional Review Board (IRB) process at California State University, San Bernardino. This was necessary in order to gain permission to sample the human subjects due to the potential vulnerability associated with the age of the

population being sampled. Second, the researchers coded the data instrument prior to giving the participants the instrument to ensure confidentiality and anonymity. None of the participants had their names recorded or released by the researchers. Third, the researchers gathered informed consents from both the participant and their parent/guardian. Fourth, when the participant completed the data instrument, they were provided with a debriefing statement explaining the reason for conducting the research, the manner in which they could obtain results of the study, and the person to contact if the participant had any questions or concerns.

Furthermore, the instrument was scored after it was completed, while the participant was still available. Those who scored 16 or higher on the instrument were approached and informed of their high score and the need for further assessment. At this time, they were given a list of resources and numbers in their area consistent with their insurance coverage, to contact for further assessment and follow-up. The completed informed consents and data instruments were then stored in a locked filing cabinet, which only the researchers had access to. After the research project was completed, the primary investigator of the project took possession of the

informed consents and completed questionnaires. These will remain in a locked filing cabinet for a period of three years. After this time, this information will be destroyed.

Data Analysis

The data was analyzed through the use of quantitative procedures. Both descriptive statistics and inferential statistics were used in the analysis. Descriptive statistics were used to describe the sample population (Grinnell, 2001). For example, two variables to which attention was paid were ethnicity and type of diabetes. Participants were described in relation to these variables by stating how many of them fell into each category of the variable.

Inferential statistics were used to determine the probability that a relationship between two variables in the sample also exists within the population from which it was drawn (Grinnell, 2001). The measuring instrument allowed the researchers to determine the probability that a relationship between a given variable, for example, glucose control and depression, exists within the sample.

The researchers used both univariate and bivariate analysis. Univariate analysis conducts a statistical

analysis of the distribution of values of a single variable (Grinnell, 2001). The single variables that were taken into account by the researchers were depression scores, type of diabetes, glucose control, ethnicity, age, and length of diagnosis. Bivariate analysis analyzed the relationship between two variables (Grinnell, 2001). Using bivariate analysis, the independent variables were analyzed in regard to their association to diabetic adolescents with depression. For example, a bivariate analysis was done to look at the association between HbA₁C levels and depression scores.

Finally, the researchers attempted to associate numerous independent variables with diabetic adolescent depression levels. When using bivariate analysis, the researchers used Pearson's product-moment correlation coefficient (Pearson's r) to specify the strength and direction of a relation between two interval or ratio level variables. The researchers also utilized the independent samples t-test to compare the means of two samples independently drawn from the population surveyed (e.g., comparing the means of males and females, depression scores and glucose control).

Summary

The purpose of the methods section was to provide a detailed description of how this study was conducted. Explanations for the researcher's choice of participants, the data collection and procedures used, as well as the rationale for this particular study design were given. Second, descriptions of the measuring tools were presented along with a detailed account of how the human subjects were protected. In addition, the quantitative procedures that were utilized to test the hypotheses were described.

CHAPTER FOUR

RESULTS

Data analysis included descriptive and inferential statistics. Descriptive analysis included univariate statistics such as frequency distributions, measures of central tendencies, and dispersion to describe various demographic variables. Bivariate statistics such as Pearson's correlation coefficients were used to examine the relationship between the demographic variables, length of diagnosis, glucose control, and the CES-DC score. An independent samples t-test was used to examine the relationship between type of diabetes and levels of depression.

Forty-six adolescents between the ages of 12-18 voluntarily participated in the study and completed the survey. The racial distribution of the adolescents surveyed was: 23 (50%) Hispanic, 18 (39.1%) Caucasian, 2 (4.3%) African American, 2 (4.3%) Asian American and 1 (2.2%) Native American. The distribution of type of diabetes was: 36 (78.3%) type 1 and 10 (21.7%) type 2. Length of diagnosis ranged from 1 year to 16 years.

Table 1. Demographic Variables of Diabetic Adolescents
(n = 46)

	Frequency (n)	Percentage (%)
Ethnicity		
Hispanic	23	50.0
Caucasian	18	39.1
African American	2	4.3
Asian American	2	4.3
Native American	1	2.2
Type		
type 1	36	78.3
type 2	10	21.7
Years Since Diagnosis		
Mean = 4.48 yrs.		
SD = 4.054 yrs.		
1-3 yrs.	26	56.2
4-16 yrs.	20	43.6
Age		
Mean = 14.13 yrs.		
SD = 1.759 yrs.		
12-13 yrs.	23	50.0
14-18 yrs.	23	50.0
Gender		
Male	17	37.0
Female	29	63.0
Depression Score		
Mean = 13.78		
SD = 9.852		
Not depressed (< 16)	31	67.4
Depressed (\geq 16)	15	32.7

Age was an open-ended question which was collapsed into two groups based on developmental stage. Fifty percent of respondents were within the 12-13 age group with the remaining 50% in the 14-18 age group. Gender

distribution of the participants was 17 (37%) male and 29 (63%) female.

Depression scores were determined based on the total score of the CES-DC. Those scoring less than 16 were identified as not being depressed and those scoring 16 or higher were identified as depressed (Fendrich, Weissman, & Warner, 1990). Thirty-one (67.4%) of the participants scored as not depressed, while 15 (32.7%) scored as depressed (see Table 1).

Because the researchers wanted to examine demographic variables in relation to depression, additional analysis was done on three other variables (age, ethnicity, and gender) that were not included in any of the hypotheses. A Pearson Correlation was computed to observe whether a positive association existed between age and CES-DC score. Results were significant ($r = .385$, $p < .01$).

An independent samples t-test was utilized to test whether a positive association existed between ethnicity and total CES-DC score. Ethnicity was recoded into two new groups, group 1 Caucasian and Group 2 Hispanic, since 89.1% of the sample made up these two groups. Results of this analysis did not show a significant positive correlation ($t = .937$, $df = 39$, $sig. = .355$).

An independent samples t-test was also computed using the variable gender in an attempt to compare the means of males versus females with the total CES-DC score. The result of this analysis was not significant ($t = -.193$, $df = 44$, $sig. = .848$).

Presentation of the Findings

Hypothesis 1 stated that a positive association would be found between those with type 1 diabetes and higher levels of depression. To test this hypothesis, an independent samples t-test comparing type 1 vs. type 2 diabetes by total CES-DC score was computed. Results were not significant at the .05 level (see Table 2). However, the mean depression score for those with type 1 (12.39) indicates no depression, while the mean depression score for those with type 2 (18.80), on the other hand, indicates depression.

Table 2. Independent Samples t-Test Comparing Type of Diabetes with Total Depression Score ($n = 46$)

	Type 1 ($n = 36$) Mean	Type 2 ($n = 10$) Mean	t	df	sig.
Total CES-DC	12.39	18.80	-1.870	44	.068

Hypothesis 2 stated that a positive association would exist between poor glucose control and higher levels of depression. To test this hypothesis, Pearson Correlations were computed on the total CES-DC score and the current blood sugar, as well as the average HbA1c, which was computed using the HbA1c reading done on the day of the survey along with the last HbA1c reading. Results of these analyses showed there were no significant, positive correlations between the CES-DC score and glucose control (see Table 3).

Table 3. Pearson Correlation between Depression, Glucose Control and Length of Diagnosis (n = 46)

	Depression
Average HbA1c	-.001
Current Blood Glucose	-.014
Length of Diagnosis	-.039

Hypothesis 3 stated that a positive association would be found between length of diagnosis and depression, with those who have lived with diabetes longer having higher levels of depression. To test this hypothesis, a Pearson Correlation was computed. Results of this analysis did not show a significant positive correlation (see Table 3).

Hypothesis 4 stated that adolescents with diabetes would have higher rates of depression than their peers without diabetes. Research shows that in any given year, 8.3% of adolescents exhibit signs of major depression (Koplewicz, 2002). This hypothesis was supported with results showing that 15 (32.7%) of the population sampled scored in the depressed range. This result is almost four times that of the general adolescent population of 8.3%.

Summary

Chapter Four presented the results of data analysis from the project. Although a positive association between age and depression scores was found, and adolescents with diabetes were found to have higher rates of depression than the general adolescent population, none of the first three research hypotheses were supported. Those with type 1 diabetes were not found to have statistically significant higher levels of depression at the .05 level than those with type 2. However, the average scores for each group were observably different with the type 1 mean of 12.39 (not depressed) and the type 2 mean of 18.80 (depressed). No positive association was found between poor glucose control and levels of depression and no

positive association was found between length of diagnosis and levels of depression.

CHAPTER FIVE

DISCUSSION

Introduction

Included in Chapter Five is a discussion of the findings gleaned as a result of completing the project. Further, the limitations placed on and the recommendations extracted from the project are presented. The presented recommendations pertain to social work practice, policy and research. Finally, the Chapter concludes with a brief summary.

Discussion

The findings extracted from the research project are contrary to what the researchers hypothesized prior to surveying the sample population. First, the researchers believed that adolescents with type 1 diabetes would be more depressed. Instead, the researchers discovered that type 2 diabetics had higher scores for depression (18.80) than adolescents with type 1 diabetes (12.39).

The researchers had thought that there would be a significant relationship at the .05 level between the type of diabetes and depression because the treatment methods for type 1 diabetes are more intensive than for type 2 diabetes. The level of significance was set at .05 because

it is the most widely used cutoff point for rejecting null hypotheses (Weinbach & Grinnell, 2001). The level was also set at .05 in order to reduce the chance of a Type I error occurring in which a null hypothesis is rejected and a conclusion is made about a relationship existing among variables, when in fact, it does not (Weinbach & Grinnell, 2001). Data analysis did not result in significant findings between type of diabetes and depression at this level.

However, due to the unanticipated small sample size and that the study was exploratory, the researchers now feel that the more appropriate level of significance to have used would have been .10. With the level being set at .05 and with the small sample size, it is possible that a Type II error could occur.

A Type II error occurs when researchers do not reject the null hypothesis and conclude that a relationship between variables does not exist in the population from which it was drawn when, in fact, it does exist. A .10 level is used sparingly in research, but can be used when a sample size is small and is an exploratory study. Since the researchers had anticipated a larger sample size, they had not considered using the .10 level. Thus, if the researchers were to convincingly state that

there is not a relationship between type of diabetes and depression, they could potentially be committing a Type II error (Weinbach & Grinnell, 2001). As a result, the findings of this study show that there is a possibility of significance between type of diabetes and depression at the .05 level, but that a larger sample size would be needed to make solid conclusion.

Another reason, also related to sample size, for not finding a significant relationship between type of diabetes and depression may have been because there were not enough type 2 participants to allow for a valid comparison.

A third reason for not finding the expected relationship between type of diabetes and depression may have been due to the common characteristic among type 2 diabetics of being overweight. "More than 75% of all people with type 2 diabetes either are or were obese at one time or another" (American Diabetes Association, 1996). Although type 2 diabetics do not follow as intensive of a treatment regimen as type 1 diabetics, they may be suffering from lower self-esteem and lower self-confidence and thus depression, due to their overweight appearance.

In regards to the second hypothesis, the researchers believed that there would be a positive association between poor glucose control and depression. In analyzing the data, it was found that there was no association between glucose control and depression. The scope of glucose control as measured by the HbA1C among the participants ranged from 5.2% to 14.0%. A generally accepted normal level is less than or equal to 8.1%, which indicates good control (ADA, 1996).

The researchers had thought that a positive association would be present because poor glucose control causes individuals to feel sicker than individuals with good glucose control. As a result, the researchers had believed that those with poor glucose control would have higher rates of depression. They also held that there would be a relationship between poor glucose control and depression because they believed that those having poor glucose control might feel more overwhelmed by their diabetes. The sampled population showed that this is not the case, and that depression in adolescents with diabetes does not have a positive association to glucose control.

Perhaps the reason that there was not a positive association between glucose control and depression is because they may not have lived with diabetes long enough

to have felt the long-term physical effects of poor glucose control. Another reason as to why a positive association was not found was that it might be possible that they no longer feel the effects of poor glucose control due to having lived that way for a longer period of time. The adolescents may no longer remember what it was like to feel in good glucose control, and may have adapted to feeling different, so that they no longer realize they do not feel up to par.

Third, the researchers believed that the length of diagnosis would affect rates of depression among adolescents living with diabetes. Diabetes is a disease that taxes the body the longer one lives with it. As a result, the researchers believed that adolescents who had been diagnosed for longer periods of time would show higher rates of depression. The sampled population showed that there was no positive association between length of diagnosis and depression.

One reason for this result could have been due to the fact that the majority of the participants (56.2%) had been diagnosed 3 years or less. Second, it is possible that no positive association was found because of the stress placed on a recently diagnosed adolescent. It is possible that they are at the same risk of depression as

adolescents whom have lived with diabetes longer due to the shock over having been recently diagnosed with a chronic illness.

Fourth, the researchers hypothesized that adolescents with diabetes would have higher rates of depression than the general adolescent population. The rate of depression among the general adolescent population is 8.3% (Koplewicz, 2002). The researchers found that the rate of depression among the diabetic adolescent population is 32.7% (see Table 1). The rate of depression among diabetic adolescents was approximately four times higher than that of the general adolescent population.

In comparing the rate of depression among diabetic adolescents to the rate of depression among those living with chronic illnesses, the rates are shown to be quite similar. The rate of depression among those living with a chronic illness falls between 20%-25% (APA, 2000). Therefore, the rates of depression among diabetic adolescents appear to be associated with the fact that they have a chronic illness, rather than the fact that they are adolescents.

Even though it was shown that glucose control and length of diagnosis had no positive association with depression, the study did show that the adolescent

diabetic population had higher rates of depression than the general population. This information alone supports the need to have a social worker as part of the clinical team that works with adolescents living with diabetes. In addition, the study found near significant findings between type of diabetes and depression. It is hypothesized that if the researchers had obtained a larger sample size or had set the significance level at .10 due to the small sample size obtained, a significant finding between type of diabetes and depression would have been found. It is further hypothesized that data would have then shown that adolescents with type 2 diabetes are at a higher risk for depression.

Limitations

The research project had several conditions which could potentially limit the generalizability to larger populations. First, the sample size may have been too small to detect significant differences. Time constraints prevented the researchers from soliciting participation from additional diabetic adolescents. Second, the sample was taken from one clinic setting in which treatment and care are homogenous, limiting the generalizability of results to those who receive a lower level of care, or

conversely, a higher standard of care. This may have caused the results to be skewed because all those who were sampled appeared concerned enough about their diabetes to be receiving medical care and following through with medical appointments. As a result, it is possible that depression rates would have been higher if an additional sample had been obtained outside the environment of a medical clinic.

Third, the researchers had hoped to have a larger sample size of type 2 diabetics. The number of type 2 diabetics in the sample makes it difficult to generalize the results of this study to a larger population of type 2 diabetics.

Fourth, the researchers did not ask the participants whether or not they were on any psychotropic medications. Several respondents shared with the researchers that they were on psychotropic medications for depression. This may have skewed the results to show lower depression rates among diabetic adolescents due to the fact that they are already being treated.

Fifth, the researchers found that many of the potential participants did not show up for their clinic appointments. This may have also skewed, or biased, the results for it may be that those who are more depressed

might be more likely to cancel their medical appointments. Sixth, the researchers had several patients who had depressed mood and affect, but whom refused to participate in the study. This may also have affected the results, showing that depression is lower among diabetic adolescents than it really is.

Seventh, the population sampled by the researchers was approximately 80% low income and had medical coverage through Medi-Cal and California Children's Services (CCS), which may limit the generalizability of this study to other populations of diabetic adolescents (i.e., those with higher income, more adequate insurance, and more resources).

Recommendations for Social Work Practice, Policy and Research

Implications for Social Work Practice

Social workers working with this population must realize the importance of assessing for depression. The researchers found that the rates of depression were approximately four times higher for adolescents with diabetes than for the general adolescent population. In addition, it is likely that with a larger population size, the researchers would also have found a significant difference between type of diabetes and depression. To

ensure that a diabetic adolescent is receiving the best medical care possible, depression should be assessed for, and if found, should be a factor in the medical care that is provided.

It is important to have a social worker as part of the medical team providing care to diabetic adolescents in order to ensure that the adolescent is being properly screened for depression and so that the adolescent can be referred for appropriate mental health care if needed. A total of 15 participants (32.7%) were referred for mental health services by the researchers. If the research project screening for depression had not been conducted, those who were found to be at-risk for depression would not have been identified.

Social workers have training in the biopsychosocial model of assessment, in comparison to the medical model used by most medical staff. The biopsychosocial model incorporates biological, psychological, and social information pertaining to the adolescent (Sands, 2001). Social workers have the training to conduct comprehensive assessments that can identify depression and can provide the medical team with information as to why the adolescent may be depressed. This is especially important for diabetic adolescents because depression can intensify

medical symptoms, promote poor glucose control, and increase the risk of diabetes complications (Lustman, Griffith, & Clouse, 1996).

A social workers' assessment could assist the adolescents' physical, not just mental, health. As part of the research project, each adolescent that scored as depressed was referred for mental health services. These referrals could prove to help the adolescent in numerous ways, showing just how important it is to have a social worker as part of the medical team.

Policy

Loma Linda University Medical Center is the only hospital in San Bernardino County which provides a team approach that includes the presence of a social worker in working with diabetic adolescents. Since depression among diabetics can cause them health problems, it is imperative that a social worker be part of each medical center working with diabetic adolescents. Social workers are trained to assess for depression and are also trained in conducting interventions.

Hospital policies need to reflect the importance of a patient's mental health in association with their physical health. Social work services to patients should not be limited to adolescents covered by Medi-Cal. Adolescents

with diabetes are at a higher risk of depression than the general adolescent population. Therefore, policies should reflect this and encompass social work services for all diabetic adolescents seen in hospitals and clinics. Making a social worker a mandatory part of the medical team would be the way to truly provide a patient with the best medical care possible.

Future Research

Further research looking at the difference of depression rates about type 1 and type 2 diabetic adolescents would be necessary to resolve the question of whether or not there is a significant difference in the rates. A larger sample size would be needed to determine whether or not this is occurring. Further research is needed to assist social workers in determining whether or not to focus additional attention on those diagnosed with type 2 versus type 1 diabetes.

Second, further research looking at causation of depression in adolescents with diabetes is needed to help medical teams come up with prevention and treatment. Use of a screening tool that focuses on causation, rather than merely assessing for depression, would be helpful for better understanding the associations.

The researchers also focused the study on adolescents between the ages of 12-18. Data analysis resulted in statistically significant differences in depression rates according to age. The findings suggest that adolescents 14 and older have higher rates of depression than pre-adolescents (12-13). A more focused study on adolescents in high school (ages 14-18) might provide different results showing higher depression rates, when done on a larger scale than the current study.

In conclusion, more extensive research is needed to ensure that proper assessment and identification of depressed diabetic adolescents is conducted. In addition, further research could support the need for a social worker to be part of a medical team working with diabetic adolescents. If the researchers had not been conducting this study, fifteen adolescents identified as depressed would have been overlooked and possibly not received mental health services/treatment.

Conclusions

The conclusions extracted from the project follows. Rates of depression among diabetic adolescents are higher than rates of depression among the general adolescent population. Type of diabetes, length of diagnosis, and

glucose control were not found to be positively associated with depression among diabetic adolescents. However, because of the obvious differences in depression scores for type 1 versus type 2 diabetes, the question of whether or not type of diabetes affects rates of depression remains open. Further research with a larger sample size would be needed to determine whether or not there is an association.

Regardless, due to the high rates of depression found among diabetic adolescents, the need for a social worker as part of the medical team has still been shown. Each medical team working with diabetic adolescents needs a social worker who can use the biopsychosocial model to assess and treat depression among diabetic adolescent patients.

APPENDIX A
CENTER FOR EPIDEMIOLOGICAL
STUDIES DEPRESSION SCALE
FOR CHILDREN

The following questions will be asking you about your feelings during the past week. Please circle only **one** answer for each question.

During the past week:

1. I was bothered by things that don't usually bother me.
Not at all A little Some A lot
2. I didn't feel like eating; I wasn't hungry.
Not at all A little Some A lot
3. I wasn't able to feel happy, even when my family or friends tried to help me feel better.
Not at all A little Some A lot
4. I felt like I was just as good as other kids.
Not at all A little Some A lot
5. I felt like I couldn't pay attention to what I was doing this week.
Not at all A little Some A lot
6. I felt down and unhappy this week.
Not at all A little Some A lot
7. I felt like I was too tired to do things this past week.
Not at all A little Some A lot
8. I felt like something good was going to happen.
Not at all A little Some A lot

Please circle only **one** answer for each question.

9. I felt like things I did before didn't work out right.
Not at all A little Some A lot
10. I felt scared this week.
Not at all A little Some A lot
11. I didn't sleep as well as I usually sleep this week.
Not at all A little Some A lot
12. I was happy this week.
Not at all A little Some A lot
13. I was more quiet than usual this week.
Not at all A little Some A lot
14. I felt lonely, like I didn't have any friends.
Not at all A little Some A lot
15. I felt like kids I knew were not friendly or that they didn't want to be with me.
Not at all A little Some A lot
16. I had a good time this week.
Not at all A little Some A lot
17. I had crying spells this week.
Not at all A little Some A lot
18. I felt sad.
Not at all A little Some A lot
19. I felt people didn't like me this week.
Not at all A little Some A lot
20. I was hard to get started doing things this week.
Not at all A little Some A lot

APPENDIX B
PARTICIPANT INFORMATION

Please read the following carefully and circle your answer or fill in the blank.

What is your gender?

Male

Female

What was your age on your last birthday? _____

What is your ethnicity? Circle all that apply.

African American/Black

American Indian/Native American

Asian American

Caucasian/White

Hispanic/Latino American

Other (please specify) _____

What year were you diagnosed with diabetes? _____

What type of diabetes do you have?

Type I

Type II

How are you treating your diabetes?

Please circle all that apply

Insulin

Oral Medications

Diet

Exercise

Other (Please specify) _____

APPENDIX C
CODED FACE SHEET

Code Number _____

Participant's last 2 A₁C levels _____

Participant's current blood sugar reading _____

APPENDIX D
INFORMED CONSENT



LOMA LINDA UNIVERSITY

Graduate School
Department of Psychology

11130 Anderson Street
Loma Linda, California 92350
(909) 558-8577
FAX: (909) 558-0171

INFORMED CONSENT

DEPRESSION SCREENING FOR ADOLESCENT DIABETIC PATIENTS

You are invited to participate in this research study because you or your child is an adolescent between the ages of 12-18 who has diabetes. Throughout this informed consent, the word "you" will refer to both you (the parent) and you (the adolescent). If you are 18, you do not require your parent's consent to participate. Before you give your consent, please read the following and ask whatever questions you may have. The following information will explain the details of the study.

PURPOSE OF THE STUDY

The purpose of this study is to learn if there is a connection between depression (feeling bad) and diabetes in adolescents. In addition, this study will examine how different factors such as gender, type of diabetes, length of diagnosis, glucose control, and method of treatment may affect rates of depression in adolescents with diabetes.

PROCEDURE

If you give consent for your child to participate in this study, and if your child assents to help with the study, the adolescent will be asked to answer some questions regarding their diabetes and their thoughts/feelings. The questionnaires will include questions about the different kinds of thoughts and feelings they have had in the past week. The adolescent will be asked to rate their thoughts/feelings on a scale of 0-3. For example, a question may ask the subject to rate how often they have "felt happy" and how often they have "felt sad." The questionnaires should take no longer than 5-10 minutes to complete. In addition, the adolescent's A1C and blood glucose scores as recorded on the front of their medical chart will be entered into the research data. The researchers will not be accessing any information from inside the medical chart, nor will this information be used for any purpose other than this particular study.

____ Initials

____ Date

Page 1 of 3

LOMA LINDA UNIVERSITY
INSTITUTIONAL REVIEW BOARD
APPROVED 1/21/03 VOID AFTER 1/20/2004
#12319 CHAIR R.J. Ruppel

DEPRESSION SCREENING FOR ADOLESCENT DIABETIC PATIENTS

RISKS/DISCOMFORTS

It may be possible that, while the adolescent is filling out the questionnaires, they may feel uncomfortable with some of the things that come to mind. If this happens, they may stop at any time they wish. However, please return all of the research materials, whether you have used them or not, to the investigator who first provided you with the questionnaires.

BENEFITS OF THE RESEARCH

There may not be any direct benefit to you or your child from participating in this study. Yet, it is possible that your child may benefit from the opportunity to answer questions related to their diabetes and to their thoughts/feelings over the last week. It is hoped that the information obtained from this study may benefit other adolescents in the future who have both diabetes and depression. In addition, it is hoped that the information obtained will help medical centers better screen for depression in diabetic adolescents.

PARTICIPANTS RIGHTS

Participation in this study is completely voluntary. You or your child are free to stop participating in the study at any time. In addition, you have the right to withdraw your data from the study at any time. Your decision whether or not to participate will not affect present or future medical care.

CONFIDENTIALITY

All of the responses to the questionnaire will be kept confidential. All of the information returned will be kept in a data set where the subject's identity cannot be determined. Any published document resulting from this study will not disclose any individual's identity.

ADDITIONAL COST/REIMBURSEMENT

There will be no additional cost to you for participating in this study. The adolescent will not be paid for participating.

REFERRAL

In the event that participating in this study brings up thoughts or feelings that you or your child would like to talk about, you can contact the Social Work Office at the Faculty Medical Office. The telephone number for the office is (909) 558-2066. If you have any

____ Initials

____ Date

Page 2 of 3

LOMA LINDA UNIVERSITY
INSTITUTIONAL REVIEW BOARD
APPROVED 11/21/03 VOID AFTER 11/20/2004
#52519 CHAIR R. J. Ripplund

APPENDIX E
INSTITUTIONAL REVIEW BOARD
LOMA LINDA UNIVERSITY

INSTITUTIONAL REVIEW BOARD
Initial Approval Notice - Expedited Review

OSR # 52319

OFFICE OF SPONSORED RESEARCH • 11188 Anderson Street • Loma Linda, CA 92350
(909) 558-4531 (voice) • (909) 558-0131 (fax)

To: Riggs, Matt
Department: Psychology
Protocol: *Depression and diabetes in adolescents*

This study was reviewed and approved administratively on behalf of the IRB. This decision includes the following determinations:

1. Risk to research subjects: **Minimal**
2. Approval period begins **01/21/2003** and ends **01/20/2004**.
3. Stipulations of approval are: **(None Specified)**

Consent Form

If a written consent form is required, approval will be indicated by the affixed IRB approval stamp. This now becomes your official consent form for the dates specified and should be used as a master for making the necessary copies.

Adverse Events / Protocol Changes

The IRB should be notified in writing of any modifications to the approved research protocol. All adverse effects, anticipated or not, should be reported to the IRB: serious events should be reported within seven days; all others within 15 days.

Protocol Review

To assure uninterrupted approval of this project, you are required to complete and return a status report at least two weeks prior to the approval end-date indicated above. (See <http://research.llu.edu> - select "IRB Tools for Investigators", then "Research Report Form.") In addition to requesting a renewal, you may also use the Research Report Form to close the study.

Records

All records relating to this project, including signed consent forms, must be kept on file for three years following completion of the study.

Please note the PI's name and the OSR number assigned your IRB application (as indicated above) on any future communications with the IRB about this project. Direct all communications to the IRB c/o the Office of Sponsored Research.

Thank you for your cooperation in LLU's shared responsibility for the ethical use of human subjects in research

Signature of IRB Chair/Designee: 

The Institutional Review Board holds Multiple Project Assurance (MPA) No. M-1295 with the U.S. Office for Human Research Protections and is assigned ID#01NR. This Assurance applies to the following institutions: Loma Linda University (and its affiliated medical practice groups), Loma Linda University Medical Center (including Loma Linda University Children's Hospital, LLU Community Medical Center), Loma Linda University Behavioral Medicine Center, and the Blood Bank of San Bernardino and Riverside Counties.

IRB Chair:
Rhodes L. Riggsby, M.D.
Department of Medicine
(909) 558-2341, rriggsby@ahs.llumc.edu

IRB Administrator:
Linda G. Halstead, M.A., Director
Office of Sponsored Research
Ext. 43570, Fax 80131, lhalstead@univ.llu.edu

IRB Specialist:
Anuradha Job, MPH
Office of Sponsored Research
Ext 87130, Fax 80131, ajob@univ.llu.edu

INSTITUTIONAL REVIEW BOARD
Initial Approval Notice - Expedited Review

OSR# 52319

OFFICE OF SPONSORED RESEARCH • 11188 Anderson Street • Loma Linda, CA 92350
(909) 558-4531 (voice) • (909) 558-0131 (fax)

To: **Riggs, Matt**
Department: **Psychology**
Protocol: **Depression and diabetes in adolescents**

This study was reviewed and approved administratively on behalf of the IRB. This decision includes the following determinations:

1. Risk to research subjects: **Minimal**
2. Approval period begins **01/21/2003** and ends **01/20/2004**.
3. Stipulations of approval are: **(None Specified)**

Consent Form

If a written consent form is required, approval will be indicated by the affixed IRB approval stamp. This now becomes your official consent form for the dates specified and should be used as a master for making the necessary copies.

Adverse Events / Protocol Changes

The IRB should be notified in writing of any modifications to the approved research protocol. All adverse effects, anticipated or not, should be reported to the IRB: serious events should be reported within seven days; all others within 15 days.

Protocol Review

To assure uninterrupted approval of this project, you are required to complete and return a status report at least two weeks prior to the approval end-date indicated above. (See <http://research.llu.edu> - select "IRB Tools for Investigators", then "Research Report Form.") In addition to requesting a renewal, you may also use the Research Report Form to close the study.

Records

All records relating to this project, including signed consent forms, must be kept on file for three years following completion of the study.

Please note the PI's name and the OSR number assigned your IRB application (as indicated above) on any future communications with the IRB about this project. Direct all communications to the IRB c/o the Office of Sponsored Research.

Thank you for your cooperation in LLU's shared responsibility for the ethical use of human subjects in research.

Signature of IRB Chair/Designee: *Llewellyn Halstead*

The Institutional Review Board holds Multiple Project Assurance (MPA) No. M-1295 with the U.S. Office for Human Research Protections and is assigned ID#01NR. This Assurance applies to the following institutions: Loma Linda University (and its affiliated medical practice groups), Loma Linda University Medical Center (including Loma Linda University Children's Hospital, LLU Community Medical Center), Loma Linda University Behavioral Medicine Center, and the Blood Bank of San Bernardino and Riverside Counties.

IRB Chair:
Rhodes L. Riggsby, M.D.
Department of Medicine
(909) 558-2341, riggsby@ahs.llumc.edu

IRB Administrator:
Linda G. Halstead, M.A., Director
Office of Sponsored Research
Ext. 43570, Fax 80131, lhalstead@univ.llu.edu

IRB Specialist:
Anuradha Job, MPH
Office of Sponsored Research
Ext. 87130, Fax 80131, ajob@univ.llu.edu

REFERENCES

- American Diabetes Association. (1996). *American diabetes association complete guide to diabetes*. Alexandria, VA: Author
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author
- Anderson, B. A., Auslander, W. F., Jung, K. C., Miller, J. P., & Santiago, J. V. (1990). Assessing family sharing of diabetes responsibilities. *Journal of Pediatric Psychology*, 15, 477-492.
- Bergman, M., Akin, S., & Felig, P. (1988). Psychological issues in diabetes care. *American Family Physician*, 37(4), 151.
- Ciechanowski, P. S., Katon, W. J., & Russo, J. E. (2000). Depression and diabetes: Impact of depressive symptoms on adherence, function and costs. *Archives of Internal Medicine*, 160, 3278-3285.
- DeCoster, V. A. (2001). Challenges of type 2 diabetes and role of social work: A neglected area of practice. *Health and Social Work*, 26(1), 26-37.
- DeGroot, M., Jacobson, A. M., Samson, J. A., & Welch, G. (1999). Glycemic control and major depression in patients with Type 1 and Type 2 diabetes mellitus. *Journal of Psychosomatic Research*, 46(5), 425-435.
- Eaton, W. W., Mengel, M., Mengel, L., Larson, D., Campbell, R., & Montague, R. B., (1992). Psychological and psychopathologic influences on management and control of insulin-dependent diabetes. *The International Journal of Psychiatry in Medicine*, 22(2), 105-117.
- Fendrich, M., Weissman, M., & Warner, V. (1990). Screening for depressive disorder in children and adolescents: Validating the center for epidemiologic studies depression scale for children. *American Journal of Epidemiology*, 131(3), 538-551.

- Grey, M., Davidson, M., Boland, E. A., & Tamborlane, W. V. (2001). Clinical and psychosocial factors associated with achievement of treatment goals in adolescents with diabetes mellitus. *Journal of Adolescent Health, 28*, 377-385.
- Grinnell, R. M. (2001). *Social work research and evaluation: Quantitative and qualitative approaches* (6th ed.). Normal, IL: F. E. Peacock.
- Helz, J. W., & Templeton, B. (1990). Evidence of the role of psychological factors in diabetes mellitus: A review. *American Journal of Psychiatry, 147*(10), 1275-1282.
- Jacobson, A. M. (1996). The psychological care of patients with insulin-dependent diabetes mellitus. *The New England Journal of Medicine, 334*(19), 1249-1253.
- Jacobson, A. M., Hauser, S. T., Willett, J. B., Wolfsdorf, J. I., Dvorak, R., Herman, L., et al. (1997). Psychological adjustment to IDDM: 10-year follow-up of an onset cohort of child and adolescent patients. *Diabetes Care, 20*(5), 811-818.
- Johnson, S. B., Kelly, M., Henretta, J. C., Cunningham, W. R., Tomer, A., & Silverstein, J. H. (1992). A longitudinal analysis of adherence and health status in childhood diabetes. *Journal of Pediatric Psychology, 17*, 537-553.
- Juvenile Diabetes Research Foundation [JDRF]. (2003). *The rise of type 1 diabetes in the 20th century*. Retrieved on April 5, 2003, from http://www.jdrf.org/index.cfm?fuseaction=home.viewPage&page_id
- Koplewicz, H. S. (2002). *More than moody: Recognizing and treating adolescent depression*. New York: G. P. Putnam's Sons
- Kovacs, M., Goldston, D., Obrosky, S., & Bonar, L. (1997). Psychiatric Disorders in youths with IDDM: Rates and risk factors. *Diabetes Care, 20*(1), 36-44.

- Kovacs, M., Goldston, D., Obrosky, S., & Drash, A. (1997). Major depressive disorder in youths with IDDM: A controlled prospective study of course and outcome. *Diabetes Care*, 20(1), 45-51.
- Leedom, L., Meehan, W., Procci, W., & Zeidler, A. (1991). Symptoms of depression in patients with type 2 diabetes mellitus. *Psychosomatics*, 32(3), 280-286.
- Lustman, P. J., & Harper, G. W. (1987). Nonpsychiatric physicians' identification and treatment of depression in patients with diabetes. *Comprehensive Psychiatry*, 28, 22-27.
- Lustman, P. J., Griffith, L. S., & Clouse, R. E. (1996). Recognizing and managing depression in patients with diabetes. In B. J. Anderson & R. R. Rubin (Eds.), *Practical psychology for diabetes clinicians: How to deal with the key behavioral issues faced by patients and health care teams* (pp. 143-154). Alexandria, VA: American Diabetes Association.
- Mahon, N. E., & Yarcheski, A. (2001). Outcomes of depression in early adolescents. *Western Journal of Nursing Research*, 23(4), 360-375.
- Mayden, R., & Nieves, J. (2000). *Social work speaks: National association of social workers policy statements 2000-2003* (5th ed.). Washington, D. C.: NASW Press.
- Mazze, R., Lucido, D., & Shamon, H. (1984). Psychological and social correlates of glycemic control. *Diabetes Care*, 7(4), 360-366.
- Mellin, E. A., & Beamish, P. M. (2002). Interpersonal theory and adolescents with depression: Clinical update. *Journal of Mental Health Counseling*, 24(2), 110-125.
- Morris, A. D., Boyle, D. I. R., McMahon, A. D., Greene, S. A., MacDonald, T. M., & Newton, R. W. (1997). Adherence to insulin treatment, glycemic control, and ketoacidosis in insulin dependent diabetes mellitus. *Lancet*, 350(9090), 1505-1510.

- Peyrot, M. and Rubin, R. (2001). Psychological issues and treatments for people with diabetes. *Journal of Clinical Psychology*, 57(4), 457-478.
- Popkin, M. K., Callies, A. L., Lentz, R. D., Colon, E. A., Sutherland, D. E. (1988). Prevalence of major depression, simple phobia, and other psychiatric disorders in patients with long-standing type I diabetes mellitus. *Archives of General Psychiatry*, 45, 64-68.
- Sands, R. G. (2001). *Clinical social work practice in behavioral mental health: A postmodern approach to practice with adults* (2nd ed.). Needham Heights, MA: Allyn and Bacon.
- Skinner, T. C., & Hampson, S. E. (1998). Social support and personal models of diabetes in relation to self-care and well-being in adolescents with type 1 diabetes mellitus. *Journal of Adolescence*, 21, 703-715.
- Weinbach, R. W., & Grinnell, R. M. (2001). *Statistics for social workers* (5th ed.). Needham Heights, MA: Allyn & Bacon.
- Zastrow, C., & Kirst-Ashman, K. (2001). *Understanding human behavior and the social environment* (5th ed.). Stanford, CT: Wadsworth.

ASSIGNED RESPONSIBILITIES PAGE

This was a two-person project where authors collaborated throughout. However, for each phase of the project, certain authors took primary responsibility. These responsibilities were assigned in the manner listed below.

1. Data Collection:

Team Effort: Leanne Graff & Karin Yakira

2. Data Entry and Analysis:

Assigned Leader: Leanne Graff

Assisted By: Karin Yakira

3. Writing Report and Presentation of Findings:

a. Introduction and Literature

Team Effort: Leanne Graff & Karin Yakira

b. Methods

Team Effort: Leanne Graff & Karin Yakira

c. Results

Assigned Leader: Leanne Graff

Assisted By: Karin Yakira

d. Discussion

Assigned Leader: Karin Yakira

Assisted By: Leanne Graff