

ROLE TRANSITION OF PARENTAL SUPPORT IN ADOLESCENTS WITH INSULIN  
DEPENDENT DIABETES MELLITUS AND THE IMPACT ON METABOLIC CONTROL

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SUSAN N. BENNER

ADVISOR DR. NAGIA ALI

BALL STATE UNIVERSITY

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## ABSTRACT

RESEARCH PAPER: Role Transition of Parental Support in Adolescents with  
IDDM and the Impact on Metabolic Control

STUDENT: Susan N. Benner

DEGREE: Masters of Science

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The transition of diabetes care from dependent- to self-care is a challenge for parents and adolescents. Poor transition of care may lead to poor management of diabetes, poor glycemic control, and may have life threatening results; therefore, it is imperative for parents and adolescents to work together for positive outcomes and effective disease management. The purposes of this comparative descriptive study are to describe perceptions of the division of diabetes self- and dependent-care responsibility among young adolescents and parents and to examine the relationship of perceptions to metabolic control of diabetes. The theoretical framework of this study is based Dorothea Orem's model of Self-Care. The sample will consist of 60 adolescents with IDDM and their parents from 3 Midwestern diabetes clinics. The Diabetes Family Responsibility Questionnaire will be used to determine the level of responsibility of parents and adolescents in diabetes care. Metabolic Control will be assessed by comparing Glycosylated Hemoglobin (HbA1c) at two intervals two months apart. Results will provide information for improving the transition of diabetes care from parents to adolescents.

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## CHAPTER I: INTRODUCTION

### *Introduction*

According to the Juvenile Diabetes Research Foundation, approximately 3 million people have Insulin Dependent diabetes and 15,000 children are diagnosed with Insulin Dependent Diabetes (Type 1 Diabetes) each year. Diagnosis of diabetes in children can be made at any age, but there is a peak incidence of diagnosis between the ages of 10-15 with 75% of diagnosis being made before the age of 18 (Hockenberry & Wilson, 2007).

Insulin Dependent Diabetes Mellitus is a chronic metabolic disease in which the beta cells of the pancreas are destroyed, usually resulting in a total cease in production of the hormone Insulin. Insulin is the hormone in the body responsible in aiding in the metabolism of carbohydrates, proteins, and fats and carrying them in to the body's cells to be used for energy to perform their functions in the body. Without this energy being transported to the cells, the body can not function properly and can have serious ramifications. Some of the complications related to diabetes include renal failure, retinopathy and blindness, neuropathies, and possibly even death (Hockenberry & Wilson, 2007).

Effective therapeutic management of diabetes depends on the collaboration of several team members including the diabetic patient, the parents, the endocrinologist, the diabetes nurse educator, the exercise physiologist, and the nutritionist. Daily management of Type 1 diabetes requires insulin management including preparation and administration, blood glucose monitoring to regulate the insulin dosage, nutrition, and

exercise. These do not include the emergent knowledge needed to handle situations of hypoglycemia and hyperglycemia (Hockenberry & Wilson, 2007).

In childhood, the majority of the day to day management of diabetes rests on the shoulders of the parents. However, as the diabetic patient reaches adolescence, the responsibilities of diabetes care begin to shift from total dependent diabetes care to self care of diabetes. This transition of care must happen during the adolescent years to ensure the diabetic is ready for complete self-care by the time they are ready to leave their parents' home and parents' care (Dashiff, 2003).

Transitioning from parent dependent diabetes care to adolescent self care of diabetes is not an easy task. For adolescents, the primary challenge is developing independence and autonomy for aspects of daily diabetes management such as insulin maintenance, blood glucose monitoring, nutrition, and exercise. For parents, a major task is determining how much responsibility the adolescent is ready to assume based on physical maturation and adolescent developmental events and how much responsibility they should retain as parents. This task is particularly tricky for parents because poor decisions made by the adolescent could have catastrophic life threatening effects and failure to make a smooth transition is also related to poor diabetes management and problems with diabetes control. Due to the increase in incidence of Type 1 Diabetes in adolescence, it is evident why self-care management of diabetes is a great concern. However, little information is available at what self-care activities adolescents participate in and what dependent-care activities the parents contribute during the transition from total dependent care to self- care. The lack of information about adolescent and parental

responsibilities during transition indicates a great need for further research (Dashiff, 2003).

### *Background and Significance*

Adolescence is a period of transition in which teens move from dependence on their parents to greater independence in meeting their own needs. During this time, parents are charged with the responsibility of helping the adolescent to assume more responsibility and gain more independence. Renegotiation of roles in the family is a significant task for teens and parents during this phase of growth and development (Leonard, Garwick, & Adwan, 2005).

Adolescents with Insulin Dependent Diabetes Mellitus not only face the normal transition of adolescence, but also face the assumption of self care management including a complex regiment of daily insulin injections, blood glucose monitoring, diet and exercise. Assumption of these roles can cause a great amount of stress on the adolescent and can cause distress in the family (Leonard et al., 2005a).

Parents of teens with Insulin Dependent Diabetes Mellitus face many issues during the transition of adolescence. A major issue that parents must negotiate is determining when the teen is ready to assume certain responsibilities for self-care and how much control parents should give up at what time (Dashiff, 2003). Parents must be aware of how much responsibility the adolescent is increasing and be careful to not reduce parental involvement too quickly, as an uneven transference of care can lead to the adolescent nor the parent being responsible for care and metabolic control is lost (Hanna & Guthrie, 2000a).



This study will build on the work of Dashiff (2003) and attempt to confirm the diabetic management roles that teens and parents participate in during the period of adolescence. By assessing the roles that adolescents and parents routinely are involved in, health care team members can determine methods in which parents and adolescents can work together more effectively to have better diabetic outcomes.

### *Problem Statement*

Glycemic control of diabetes is a challenge in adolescence. Lack of control can be related to adolescents assuming responsibility for diabetes care before ready to do so. It is imperative to transition from dependent self-care to independent self-care during adolescence. Poor transition of self-care may lead to poor management of diabetes.

### *Purpose of Study*

The purposes of this comparative descriptive study are to describe perceptions of the division of diabetes self- and dependent-care responsibility among young adolescents and parents and to examine the relationship of perceptions to metabolic control of diabetes. This is a replication of Dashiff's (2003) study.

### *Research Questions*

1. Are there differences in perceptions among parents and diabetic adolescent children in the division of self and dependent care responsibilities of self-care for metabolic control?
2. What is the relationship between parents' and adolescents' perceptions of self and dependent care responsibility and metabolic control of diabetes?

### *Conceptual Theoretical Framework*

The conceptual framework for this study is based on Dortohea Orem's Self-Care model. According to the self-care model, in order for a patient to gain optimal health they must participate in self-care behaviors. During childhood and adolescence, parents are considered dependent-care agents and are required to help the adolescents assume self-care responsibilities. In this model, adolescents and parents must work together to achieve optimal disease management (Orem, 2001).

#### *Definition of Terms*

##### *Diabetes Self-Care:*

*Conceptual.* Self-Care is defined as the performance or practice of activities that individuals initiate and perform on their own behalf to maintain life, health, and well being (Orem, 2001).

*Operational.* Self-Care will be measured with the Diabetes Family Responsibility Questionnaire tool. Through interviews with the adolescent, the tool will help the researchers to determine what activities of self-care the adolescent participates in.

##### *Diabetes Dependent-Care:*

*Conceptual.* Dependent-Care is defined as the activities that assist children or disabled persons in the performance or practice of activities that maintain life, health and well being (Orem, 2001).

*Operational.* Dependent-Care will be measured by the Diabetes Family Responsibility Questionnaire tool. Through interviews with the parents of the adolescents, the tool will help researchers determine what activities of dependent-care the parents are providing

### *Metabolic Control of Diabetes:*

*Conceptual.* Illness management is the ability of the adolescent through self-care behaviors and the parents through dependent-care behaviors to manage the disease and achieve optimal health (Orem, 2001).

*Operational.* Metabolic control will be assessed through Glycosylated Hemoglobin blood measurements. Glycosylated hemoglobin, , is the most useful index of measuring metabolic control of diabetes, because it is not affected by day to day fluctuations, but rather shows the overall blood glucose for the previous 6-8 weeks (Dashiff, 2003.)

### *Limitations*

This study would be limited by the lack of generalizability. The sample size is small. The study may also benefit from a longitudinal design, which would allow the researchers to assess the adolescents increase in participation in diabetes care over time in relation to metabolic control of diabetes.

### *Assumptions*

Insulin dependent diabetes mellitus management depends on open and honest communication and collaboration between all members involved in diabetes care including the patient, the parents, and the members of the professional diabetes management team. It is assumed that all questions will be answered honestly and that all members are working towards optimal disease management.

### *Summary*

The main task of adolescence is gaining independence. For adolescents with a chronic disease like Insulin Dependent Diabetes, this task is compounded by learning

self-care diabetes management. This transition of diabetes care from dependent on parents- to self-care is a challenge for parents as well. Poor transition of care may lead to poor management of diabetes, poor glycemic control, and may have life threatening results; therefore, parents must decide what responsibilities to turn over to the adolescent as well as deciding when the adolescent is mature enough to handle the responsibilities assigned to them. This study will investigate the perceived roles of parents and teens in diabetes management during the transitional time of adolescence. Dorothea Orem's (2001) Self-Care Model will be used.

## CHAPTER II: REVIEW OF LITERATURE

### *Introduction*

The main task of adolescence is gaining independence. For adolescents with a chronic disease like Insulin Dependent Diabetes, this task is compounded by learning self-care diabetes management. This transition of diabetes care from dependent on parents- to self-care is a challenge for parents as well. Poor transition of care may lead to poor management of diabetes, poor glycemic control, and may have life threatening results; therefore, parents must decide what responsibilities to turn over to the adolescent as well as deciding when the adolescent is mature enough to handle the responsibilities assigned to them. By working together and communicating well with each other, the parents and adolescents can ensure positive transition outcomes and effective disease management (Dashiff, 2003).

The purposes of this comparative descriptive study are to describe perceptions of the division of diabetes self- and dependent-care responsibility among young adolescents and parents and to examine the relationship of perceptions to metabolic control of diabetes. This is a replication of Dashiff's (2003) study.

The literature review concerning the transition of diabetes care from parents to adolescents is divided into two sections: (a) theoretical framework, and (b) transition of diabetes care. Section B, transition of diabetes care, is subdivided into (a) parental involvement in adolescents' diabetes management, (b) adolescents' perceptions of parental roles and involvement in diabetes management, (c) parent-adolescent communication and support for diabetes management, (d) parents' and adolescents'

perceptions of helpful and non-helpful support, (e) adolescents' perceived benefits and barriers related to diabetes self-management, (f) parents' perceived benefits and barriers of adolescents' diabetes self-management, (g) role of parental care, control, and involvement on health-related quality of life and metabolic control, (h) benefits of parental acceptance on adolescent adherence and metabolic control, (i) relationship of family structure, maternal employment, and family Conflict with self-care adherence, (j) family functioning and metabolic control, (k) family influence on self-care, quality of life, and metabolic control, and (l) maintaining parent-adolescent teamwork in diabetes management.

#### *Theoretical Framework*

Orem's Self-Care model is the conceptual framework for this study. Orem (2001) defines self care as the performance or practice of activities that individuals initiate and perform on their on behalf to maintain life, health, and well being. Orem (2001) also states Health deviation self care is directed towards managing illness, prevention of illness complications, and rehabilitation. Children are dependent on Parents for self-care activities. During this stage of development, Parents become dependent-care agents. Orem (2001) states that self-care and dependent care are interrelated and in times of illness both are needed to achieve optimal health. Therefore, both Self-Care responsibility of adolescents and Dependent-Care responsibility of parents are needed to achieve optimal disease control in the adolescent diabetic patient (Dashiff, 2003).

*Transition of Diabetes Care**Parental Involvement in Adolescents' Diabetes Management*

During adolescence, primary care of diabetes transitions from parental care to independent care. Experts have found that continued parental involvement in diabetes care during adolescence leads to better patient outcomes. However, further information is needed to determine what kind of and level of involvement is needed. The purpose of this descriptive study was to examine parents' perceptions of their role in adolescent diabetes care (Hanna & Guthrie, 2003).

The participants were recruited from diabetes specialty clinics in the mid-western and western states of the United States. Thirty-one parents of adolescents with type 1 diabetes were recruited. In order to be included in the study, the parents had to be living with and involved in the care of an adolescent diabetic who was diagnosed before 10 years of age, to be able to speak English, and to be free of obvious physical or mental (Hanna & Guthrie, 2003).

The Diabetes Family Responsibility Questionnaire was manipulated to develop five different checklists for administration in the study. The checklists were used to determine if the parents were involved or were not involved in several different aspects of diabetes care. The questionnaires consisted of 34 questions about daily diabetes management. A physician researcher reviewed the checklists to insure thoroughness and appropriateness. One checklist was used to determine paternal involvement in performance of diabetes management. This checklist was found to be reliable with a Kuder-Richardson alpha reliability of 0.81 (Hanna & Guthrie, 2003).

A second checklist was used to determine parental involvement in decision making for diabetes management. This checklist was used to determine who made decisions for diabetes care, rather than who performed diabetes management tasks. This checklist had a Kuder-Richardson alpha reliability of 0.87. The third and fourth checklists were used to determine communication amount and communication agreement about diabetes management. This checklist was used to determine if parents and adolescents discussed diabetes management tasks and if they agreed about each task. The Kuder-Richardson reliability was 0.84 and 0.96 respectively for these checklists. The final checklist was used to determine parental support for diabetes management. This checklist was used to determine if parents tried to help adolescents with the daily diabetes management tasks. The Kuder-Richardson reliability was 0.89 (Hanna & Guthrie, 2003).

The first research question was: What is the difference in parental involvement in diabetes management (performance, decision making, communication, and support) as reported by parents of early-, middle-, and late-stage adolescents with type 1 diabetes? Findings were that there was a decrease in parental performance of diabetes management from early to middle to late adolescence. However, because there was a great variability in standard deviations in terms of parental involvement during the different stages of adolescence, a non parametric Kruskal Wallis test was used to determine if there were significant changes in parental involvement. No significant differences in parent involvement in diabetes management during the different stages of adolescence were found (Hanna & Guthrie, 2003).

The second research question was: What is the relationship among various aspects



of parental involvement in diabetes management (performance, decision making, communication, and support) and metabolic control, as reported by parents of adolescents with type 1 diabetes? Using Pearson correlations the findings were that parental provision of support was significantly related to parental involvement in performance of ( $r=0.71$ ,  $P = 0.000$ ) and decision making for ( $r=0.50$ ,  $P=0.004$ ) diabetes management. Parental involvement in performance of diabetes management was significantly correlated with parental involvement in decision making for diabetes management ( $r=0.65$ ,  $P=0.000$ ) and was nearly significantly correlated with communication agreement for diabetes management ( $r=0.35$ ,  $P=0.057$ ). There was no significant relationship found between any of these aspects of parental involvement and metabolic control (Hanna & Guthrie, 2003).

Hanna and Guthrie (2003) concluded that parental involvement in terms of performance of tasks, as well as decision making, support, and communication provide a way for parents to be involved yet facilitate adolescents' development of competence in diabetes management responsibility.

#### *Adolescents' perceptions of parental roles and involvement in diabetes management*

Adolescence is a period of transition providing teens a time to move from dependence on parents to greater independence. For adolescents with Type 1 diabetes, this is a time where responsibility for diabetes care shifts from parental management to self management. Understanding parental involvement in diabetes management from the teens' point of view is important because parental involvement has been associated with better outcomes among adolescents with Type 1 diabetes. The authors of this study investigated how teens view parents' roles and involvement in diabetes management. The research focused on how teens with higher versus lower levels view

parents' involvement in diabetes management. The quality of the relationships with parents was also investigated (Leonard, Garwick, & Adwan, 2005a).

Eighteen participants were recruited from a pediatric endocrinology service in a large tertiary medical center in the Midwest and from a group of teenagers with IDDM who attended a seminar on insulin pumps given by the service. Inclusion criteria were: adolescents with a diagnosis of Type 1 diabetes, between the ages of 14 and 16 years, spoke English, and had no other major medical condition. The participants were all Caucasian adolescents who lived in single or two parent households at the time of the interview (Leonard et al., 2005a).

After determining the participants for the study, the authors averaged the levels for the previous 12 months to divide the study participants into adolescents with greater than 8% (HiA1c) and adolescents with HbA1c lower than 8% (LoA1c). Approval for the study was obtained from University of Minnesota's Institutional Review Board (Leonard et al., 2005a).

The data were collected through three interviews. These interviewers included the principal investigator and two doctoral nursing students. The interviewers used an interview guide of open ended questions about living with diabetes and the following suggested probe questions: "Who is more involved in your care, and in what ways?", "What kind of diabetes management tasks do your parents perform?", and "How has your parents' involvement changed since you were first diagnosed?". All interviews were audio-taped and subsequently transcribed verbatim (Leonard et al., 2005a).

Qualitative content analytic methods were used to identify and compare how the groups of higher and lower HbA1c described the relationships with parents and family as

well as parents' involvement with diabetes management. The investigators used a consensual process to develop initial coding categories organized to make a preliminary coding template. The authors used cross-comparative strategies to identify similarities and differences in the ways that participants in the HiA1c group versus those in the LoA1c group talked about the specific themes (Leonard et al., 2005a).

From the results of the study, Leonard et al. (2005a) identified the following five common themes: (a) "Gaining Freedom and Responsibility for Diabetes Management"; (b) "Feeling Bothered by Parental Reminders to Manage Diabetes"; (c) "Closeness of Family and Parental Relationships"; (d) "Parental Monitoring of Diabetes"; and (e) "Teen-Parent Conflict Related to Diabetes."

The findings for "gaining freedom and responsibility for Diabetes management" differed between the two groups. Teens in the LoA1c group talked about gaining freedom and responsibility for diabetes management while parents continued to keep track of metabolic control, than in the HiA1c group. The teens in the HiA1c group talked about gaining some control, but talked about the difficulties they were having occasionally skipping blood glucose testing, insulin or meals (Leonard et al., 2005a).

The finding for the "feeling bothered by parental reminders to manage diabetes" also differed between the groups. The teens in the HiA1c group had a more negative view of parental reminders than the teens in the LoA1c group. Adolescents in the HiA1c group reported being irritated by parental reminders, though they were the same adolescents that reported skipping shots and glucose monitoring. Teens in the HiA1c group reported ignoring parental reminders rather than using the reminders to improve their diabetes management (Leonard et al., 2005a).

The view of the teens about the “closeness of family and parental relationships” varied between the two groups as well. More teens in the LoA1c group talked about how supportive their parents were than those in the HiA1c group. Members of both groups talked about relying on one or both parents to help with diabetes management (Leonard et al., 2005a).

Teens in both the HiA1c and LoA1c were aware of their “parental monitoring and role in diabetes management.” However, teens in the LoA1c group viewed parental roles more positively than those in the HiA1c group, who described parental close monitoring when they were skipping meals, insulin, or glucose testing (Leonard et al., 2005a).

The theme “teen-parent conflict related to diabetes” was shown only in the participants in the HiA1c group. These teens reported a high degree of disagreement with parents about diabetes management. Some of the teens attributed this to the lack of adherence with the adolescents’ diabetes treatment plan (Leonard et al., 2005a).

The authors concluded the participants were aware of the parents’ involvement in helping with diabetes care. Overall, teens in both groups felt supported by parents and talked about how parents were assuming more responsibility for diabetic care. The importance of the quality of the relationship between adolescents with diabetes and parents as a critical factor in diabetes management was emphasized as well. Teens with a close and supportive relationship with parents showed better metabolic control than those with persistent conflict between the teen and the parents. The authors found that family communication and conflict resolution skills were strong predictors of type 1 diabetes outcome variables (Leonard et al., 2005a).

*Parent-Adolescent Communication and Support for Diabetes Management*

Parental involvement in adolescent's diabetes management is advocated for better metabolic control. However, little is known about the specific ways parents are involved or adolescents' view of this parental involvement in diabetes management.

The purpose of this study was to examine parental involvement in terms of communication and support and the relationship of parental communication and support with diabetes management responsibility and metabolic control from the perspective of adolescents with Type 1 diabetes (Hanna, Juarez, Swenson Lenss, & Guthrie, 2003)

The sample consisted of twenty-seven adolescents, age 11-18 years, with type 1 diabetes, who had been diagnosed prior to 10 years of age. To be included in the study the participants must be able to speak English and be free of any obvious mental or health problems such as neuropathy, macroangiopathy, and retinopathy). The participants were recruited from diabetes specialty clinics in mid-western and western states. The participants were approached about the study while they waited, in the participating clinics, for appointments concerning diabetes management. The participants could complete the surveys at the time they were approached in the office or could set up a phone interview at a later time (Hanna et al., 2003).

The adolescents who participated in this study were asked to complete the following checklists: Independent Functioning in Diabetes Management Checklist, Independent Decision Making in Diabetes Management Checklist, Communication of Diabetes Management Checklists, and the Parental Support for Diabetes Management Checklists. The Checklists, adapted from the Diabetes Family Responsibility Questionnaire included questions on daily management issues such as glucose

monitoring, insulin administration, food choices, exercise and dental hygiene, in addition to questions on non-daily management issues such as monitoring supplies, making appointments and discussing diabetes with adult and friends. A physician researcher reviewed the items in the checklists for thoroughness and appropriateness (Hanna et al., 2003).

The Independent Functioning in Diabetes Management checklist focused on who performed the tasks of diabetes management. The Kuder Richardson alpha reliability was .87 for the Independent Functioning in Diabetes Management (Hanna et al., 2003). The Independent Decision Making in Diabetes Management Checklist focused on who made the decisions for diabetes management rather than who performed the tasks. The Kuder Richardson alpha reliability was .89 for the Independent Decision Making in Diabetes Management (Hanna et al., 2003).

Communication of Diabetes Management consisted of two checklists. One checklist on amount of communication about diabetes management topics and one checklist on agreement of communication about diabetes management topics were used. The Kuder Richardson alpha reliabilities were .98 for Communication Amount and .99 for Communication Agreement Checklists (Hanna et al., 2003).

Parental Support for Diabetes management consisted of two checklists. One checklist on seeking parental support for diabetes management and one checklist on receiving parental support for diabetes management were used. The Kuder Richardson alpha reliabilities were .97 for seeking Parental Support and .96 for Receiving Parental Support checklists (Hanna et al., 2003).

The research questions used by Hanna et al. (2003) in this descriptive study were the following: (a) Is there a difference between reported amount and agreement of parent-adolescent communication and between seeking and receiving of parental support for diabetes management as reported by adolescents with type 1 diabetes?; (b) Is there a difference in parent-adolescent communication (reported amount and agreement) and parental support (seeking and receiving) for diabetes management between early, middle, and late adolescence as reported by adolescents with type 1 diabetes?; and (c) What is the relationship among parent-adolescent communication and parental support with metabolic control as well as adolescent's independent functioning and decision making for diabetes management as reported by adolescents with type 1 diabetes? (Hanna et al., 2003).

In order to answer to the first research question, the researchers used the Wilcoxon rank test to determine if there were differences between reported amount and agreement of parent-adolescent communication and between seeking and receiving parental support for total diabetes management as reported by adolescents with Type 1 diabetes. From this rank test the researcher were able to determine a significant difference between communication amount and agreement for diabetes management (Wilcoxon Rank Test = 3.3,  $p=.001$ ). The researchers were also able to determine there was a significant difference between adolescents' seeking and receiving parental support for diabetes management (Wilcoxon Rank Test = 3.2,  $p=.001$ ) (Hanna et al., 2003).

In order to answer the second research question, the researchers used Kruskal-Wallis tests to determine if there were differences in parent-adolescent communication (amount of and agreement about) and parental support (seeking and receiving) for total

diabetes management between early, middle, or late adolescence as reported by adolescents with Type 1 diabetes. While the means for amount and agreement of communication did decrease between early to middle and middle to late adolescence, there were no significant differences (Hanna et al., 2003).

In order to answer the third research question, the researcher used Spearman correlations to examine the relationships among parent-adolescent communication, parental support, metabolic control, independent functioning, and independent decision making for diabetes management on adolescents with type 1 diabetes. Receiving parental support was correlated with seeking parental support ( $r = .45, p = .018$ ) as well as communication amount ( $r = .53, p = .004$ ) and communication agreement ( $r = .38, p = .05$ ). Seeking parental support was correlated to communication agreement ( $r = .52, p = .005$ ). Receiving parent support was negatively correlated to adolescents' independent decision making about diabetes management ( $r = -.45, p = .019$ ). Metabolic control was negatively correlated with communication agreement ( $r = -.42, p = .028$ ) (Hanna et al., 2003).

From the research findings, the researchers concluded that communication was an integral factor in parental support of diabetes management. Effective communication between adolescents and parents lead to better metabolic control. The researchers found that the more the adolescents sought support from parents, the more support they received. However, the researchers also found that the more adolescents received support from parents, the less autonomous they were in decision making. The researchers also found receiving unwanted parental support may stunt development of the adolescent as an independent decision maker in the adolescent's diabetes care (Hanna et al., 2003).



*Parents' and Adolescents' Perceptions of Helpful and Nonhelpful support*

There is little information available about what type of support is considered helpful and non helpful in the assumption of diabetes management responsibilities from parents to adolescents. The purpose of this study was to identify positive and negative dimensions of support related to adolescents' assumption of diabetes management responsibility from the perspectives of parents and adolescents (Hanna & Guthrie, 2001).

This study was part of a larger descriptive study on the transfer of diabetes management from parents to adolescents. Pairs of adolescents (n=16) and their parents were recruited to take part in this study from diabetes specialty clinics in one mid-western and one western state. Criteria for adolescents inclusion in the study included being 11 through 18 years of age, living with at least one parent, being diagnosed with type 1 diabetes mellitus prior to age 10, having a diabetes regimen that includes insulin injections, glucose monitoring, meal planning, and exercise, being able to speak English and being without any obvious mental or physical health problems. Criteria for parental inclusion in the study were being the primary parent involved in adolescents' diabetes management, living with adolescent, being able to speak English being without any obvious mental or physical health problems that would interfere with diabetes management (Hanna & Guthrie, 2001).

The interviews were conducted face to face in the participants' homes or a telephone interview. The parents and adolescents were separated for their interviews (Hanna & Guthrie, 2001). The parents and adolescents participated in a structured interview to identify parents' and adolescents' perceptions of helpful and non helpful

support specific to assuming diabetes management responsibility (Hanna & Guthrie, 2001).

Hanna and Guthrie (2001) used the following questions for the parents in this study:

1. What things did you do that worked well when trying to give----- help in taking over diabetes care?
2. What things did you do that did not work when trying to give ----- help in taking over diabetes care.

Hanna and Guthrie (2001) asked the adolescents the following questions

1. What things did your parent do that helped?
2. What things did your parent do that did not help?

Parents and adolescents' responses were analyzed separately by the primary investigator, who then conducted a manifest content analysis to match the descriptions to predetermined categories. The categories for the manifest analysis were based upon Barrera and Ainlay's identified dimensions or categories of support. The categories included directive guidance, non directive support, positive social interaction, and tangible assistance. Directive guidance was defined as behaviors aimed at improving one's performance. Nondirective support was the expression of intimacy, unconditional availability, esteem, and trust. Positive social interaction referred to joking and engaging in social interactions for fun and relaxation. Tangible assistance was defined as a form of physical assistance such as helping with tasks or paying for supplies. These categories were identified from concept analysis and were confirmed through factor analysis, showing the credibility and validity of the categories. An interrater, who was a doctorate nurse and diabetes educator, placed the descriptions into the identified categories. Prior

to the interrater placing the descriptions in categories the primary investigator and the interrater discussed definitions of meanings and support behavior category. Agreement was 100% between the primary investigator and the interrater (Hanna & Guthrie, 2001).

Parents supplied twenty-two descriptions of helpful support. The majority of the helpful behaviors identified by parents (n=14) were placed in the category of directive guidance. The parents' definitions of directive guidance varied from direct commands to subtle suggestions. The remaining eight descriptions were divided equally among nondirective support and tangible assistance (Hanna & Guthrie, 2001).

Parents identified thirteen descriptions of nonhelpful support. The nonhelpful behaviors according to parents were centered around giving too much or too little directive guidance (n=12). One parent responded that tangible assistance was not helpful, because her son didn't like anyone looking at his feet (Hanna & Guthrie, 2001).

Adolescents gave nineteen descriptions of helpful support. The helpful behaviors identified by the adolescents included directive support, nondirective support, and tangible assistance. The majority of the adolescences (n=11) described tangible assistance as being helpful support. Ten adolescents described parents helping with daily tasks as helpful. One adolescent stated that parent not offering tangible assistance was helpful. Five adolescents stated directive guidance as helpful. Three adolescents described nondirective support as helpful (Hanna & Guthrie, 2001).

Adolescents identified six descriptions of non helpful support. The majority of the adolescents (n=4) states that too much or too little directive guidance was not helpful. The remaining two responses were related to tangible assistance not being helpful, such as helping the adolescents with tasks (Hanna & Guthrie, 2001).

Hanna and Guthrie (2001) identified the following research questions for use in this study: 1) What are parents' and adolescents' perceptions of helpful dimensions of support related to adolescents assuming diabetes management responsibility? ; and 2) What are parents' and adolescents' perceptions of nonhelpful dimensions of support related to adolescents' assuming diabetes management responsibility?

The parents and the adolescents both describe directive guidance, non directive guidance, and tangible assistance as helpful support for diabetes management. However, the parents and adolescents also identify directive guidance and tangible assistance as non helpful support. This phenomenon supports the premise that support has both positive and negative aspects. Most adolescents perceived subtle guidance as helpful and direct guidance that was too direct or not needed as not helpful. This suggested that the adolescents are seeking autonomy and too direct or guidance which is not needed threatens that autonomy. The researchers also concluded from the findings that most adolescents wanted involvement with tangible assistance from parents. Indicating diabetes management is better when parents are involved (Hanna & Guthrie, 2001).

#### *Adolescents' Perceived Benefits and Barriers Related to Diabetes Self-Management*

During Adolescence, diabetes management responsibility is transferred from parent to adolescent. Weighing benefits and barriers are part of health behavior decision making according to the classic Health Belief Model. The purpose of the study was to identify adolescents' perceptions that may influence assuming diabetes management from their parents. The research question was: What are adolescents' perceived benefits and barriers related to assuming diabetes management from their parents? (Hanna & Guthrie, 2000a).

Adolescents (n=16) were chosen to participate in this study, which was part of a larger descriptive study. The participants were recruited from diabetes specialty clinics in western and mid-western states. For inclusion in the study, the participants were required to be between 11-18 years of age, to living with at least one parent, to be diagnosed with type 1 diabetes before 10 years of age, to have a diabetes regimen that includes insulin injections, glucose monitoring, meal planning, and exercise, to be able to speak English, and to be free of any obvious mental or physical health problems such as neuropathy, macroangiopathy and retinopathy. The interviews were then conducted face to face at the clinics where the participants were recruited from or over the telephone (Hanna & Guthrie, 2000a).

After approval from the institutional review boards where the primary investigator was affiliated, an interview was conducted to identify perceptions involved in the transfer of diabetes management from the perspective of adolescents. The interview consisted of the following four questions: (a) What are the pros or advantages for you?; (b) What are the pros or advantages for your parent(s)?; (c) What are the cons for you?; and (d) What are the cons for you parent(s). These questions were based on the Janis and Mann's classic decisional balance sheet that emphasizes pros/advantages and cons/disadvantages for self and for significant others (Hanna & Guthrie, 2000a).

The data were transcribed and then content analysis was conducted by the primary investigator. Descriptive expressions were identified and categories inductively generated. Then a doctorate nurse, with an expertise in diabetes and adolescents, sorted identified descriptions in to categories generated by to come up with categories for the responses. Interrater agreement was initially 74%, but once the categories were

reclassified to make broader categories there was 100% agreement (Hanna & Guthrie, 2000a).

Sixty-six descriptions of perceived benefits and barriers of assuming diabetes self management were identified and placed in to four categories: Adolescents' Perceived Benefits to Diabetes Self- Management, Perceived Benefits for Parents in Adolescents' Diabetes Self Management, Adolescents' Perceived Barrier to Diabetes Self- Management, and Perceived Barriers for Parents in Adolescents' Diabetes Self Management (Hanna & Guthrie, 2000a).

Adolescents' Perceived Benefits to Diabetes Self-Management generated nineteen descriptions that were further categorized as having knowledge of or confidence in self – management abilities, having more freedom, and having approval of others. The majority of descriptions (n = 13) were in the category of knowledge of or confidence in self –management abilities. Having more freedom and having approval of others divide the remaining six responses equally (Hanna & Guthrie, 2000a).

Perceived Benefits for Parents in Adolescents' Diabetes Self Management received twenty descriptions, all referring to the relief from responsibility, stress, and worry (Hanna & Guthrie, 2000a). Adolescents' Perceived Barrier to Diabetes Self Management consisted of fourteen descriptions. The descriptions were categorized as the burden of responsibility or lack of barriers. Responses (n=10) were in the category of burden of responsibility related to the burden of tasks and consequences. Descriptions (n=4) showed there were no barriers to diabetes self management (Hanna & Guthrie, 2000a).

Perceived Barriers for Parents in Adolescents' Diabetes Self Management gave thirteen descriptions. These thirteen descriptions were categorized as worry and guilt, loss of control, and lack of barriers. Responses (n=8) showed worry and guilt were barriers for parents in adolescent diabetes management. Responses (n=2) referred to parental loss of control to be a barrier of adolescent diabetes management. The remaining descriptions (n=3) showed there were no barriers (Hanna & Guthrie, 2000a).

In reference to the research questions, the researchers concluded adolescents perceive the benefit of freedom, but also see the burden of responsibility with diabetes self- management. Parents are perceived to have relief from the burden, but also to experience feelings of worry, guilt, and loss of control (Hanna & Guthrie, 2000a).

#### *Parents' Perceived Benefits and Barriers of Adolescents' Diabetes Self-Management*

During adolescence, parents must begin to give up responsibility for their children's diabetes management. Parents' perceptions of benefits and barriers to relinquishing responsibility may be relevant to understanding the transfer of diabetes management to the adolescent. The purpose of this study was to identify parents' perceived benefits and barriers to transferring diabetes management to adolescents. The research question used in this study is: What are parents' perceived benefits and barriers related to adolescents assuming and parent relinquishing diabetes management during adolescence (Hanna & Guthrie, 2000b)?

This study was part of a larger exploratory-descriptive study. Parents (n=17) were chosen from diabetes specialty clinics in western and mid-western states to participate in the study. For inclusion in the study participants must be parents of adolescents between 11 through 18 years of age who were diagnosed with type 1 diabetes

prior to 10 years of age and whose adolescent had a diabetes regimen that included insulin injections, glucose monitoring, meal planning, and exercise and were without any obvious mental or physical health problems such as neuropathy, macroangiopathy, and retinopathy, be living with the adolescent, be able to speak English, and be without any obvious mental or physical health problem that would impact abilities for diabetes management. The interviews were then conducted face to face or over the telephone (Hanna & Guthrie, 2000b).

After approval from the institutional review boards where the primary investigator was affiliated, an interview was conducted to identify perceptions involved in the transfer of diabetes management from the perspective of the parents. The interview consisted of the following four questions: (a) What are the pros or advantages for you?; (b) What are the pros or advantages for your son or daughter?; (c) What are the cons for you?; and (d) What are the cons for your son or daughter? These questions were based on the Janis and Mann classic decisional balance sheet that emphasizes pros/advantages and cons/disadvantages for self and for significant others which are proposed to be important in decision making (Hanna & Guthrie, 2000b).

After completing the interviews, the primary investigator conducted an inductive content analysis on the interview data. The descriptions from the data were placed in to general categories. Interrater agreement was performed by a doctoral prepared person with expertise in adolescents and diabetes. After placing the categories determined by the primary investigator there was 100% interrater agreement (Hanna & Guthrie, 2000b).

There were ninety-four responses provided by the parents of perceived benefits and barriers of adolescent diabetes management. The responses were divided into four



categories: Benefits for Parents Related to Adolescents' Diabetes Self-Management, Benefits for Adolescents Related to their Diabetes Self-Management, Barriers for Parents Related to Adolescents' Diabetes Self-Management, and Barriers for Adolescents Related to their Diabetes Self-Management (Hanna & Guthrie, 2000b).

Participants provided twenty-eight descriptions related to benefits for parents related to Adolescents' Diabetes Self-Management. The majority of the descriptions (n=23) were categorized as relief from burden related to responsibility, stress, worry, and dealing with problems. The remaining 5 descriptions reflected knowledge, confidence, and pride in their sons' or daughters' abilities and maturity (Hanna & Guthrie, 2000b).

Descriptions (n=24) were provided by the participants about the benefits for adolescents related to their diabetes self-management. Descriptions were categorized as knowledge and/or confidence in their abilities (n=11) or freedom, independence, and/or control (n=13) (Hanna & Guthrie, 2000b).

Descriptions (n=22) of barriers for parents related to adolescents diabetes self management. Eleven responses were in the category of dealing with consequences in terms of stress, worry, guilt, and problems. Responses (n=7) were generated about loss of control. One participant talked about the lack of authority. The three remaining responses states there were no barriers (Hanna & Guthrie, 2000b).

Twenty responses were given about barriers for adolescents related to their diabetes self management. Participant responses (n=17) were in the category of the burden of diabetes management related to performing diabetes management and consequences of the adolescents' actions. The remaining three responses were there were no barriers (Hanna & Guthrie, 2000b).

In answer to the research question, the researchers concluded that parents perceived both positive and negative aspects of adolescents' self management. The parents identified the benefit of parental relief of responsibility, but talked about the barrier of loss of control and having to deal with adolescents' management of diabetes. The parents also noted the relief of the burden, would mean passing the burden over to the adolescents. However, parents identified the benefits of adolescents would have knowledge and confidence in their abilities and more freedom, independence, and control (Hanna & Guthrie, 2000b).

*Role of Parental Care, Control, and Involvement on Health-Related Quality of life and Metabolic Control*

The daily stress of diabetes care is a significant stressor in adolescence and family life. An increase in parental involvement has also been found to create more diabetes-related family conflict. The aim of this study was to explore the role of perceived parental involvement, care and control in relation to self-reported health-related quality of life and metabolic control in adolescents with Type 1 Diabetes. The authors investigated whether adolescents with insulin dependent diabetes view their parents as being more involved, caring, and controlling compared to health adolescents as well as with a heterogeneous group of adolescents with other physical disabilities (Graue, Wentzel-Larsen, Hanestad, & Sovik, 2005).

The 130 adolescents with Type 1 Diabetes were recruited from the outpatient department of the Children's Hospital in Bergen, Norway. To be included in the study the adolescents must have had onset of diabetes prior to their fifteenth birthday and had diabetes for at least one year. The healthy adolescent group and the physically

handicapped group were recruited from a national general population survey. The majority of the disabilities in the handicapped group were related to hearing disabilities, but there were also a large percentage of adolescents who were motor-disabled.

Adolescents and their families were asked to complete the survey during a regularly scheduled doctor's appointment. The Regional Ethics Committee approved this study which was conducted according to the Declaration of Helsinki (Graue et al., 2005).

The authors evaluated Parental Bonding in this study by using the Parental Bonding Instrument (PBI). The PBI is an instrument used to assess parents perceived behaviors related to care and control. This instrument is based on two dimensions of parenting, the care dimension and the control dimension. Validity was determined using Cronbach's alpha. Cronbach's alpha for the care dimension of the PBI was 0.63, while the Cronbach's alpha for the control dimension of the PBI was 0.75. Parental involvement with the adolescent's friends and free time activities was assessed by the researchers by using the Parental Involvement Scale. Cronbach's alpha for the Parental Involvement scale was found to be 0.88. To study the impact of diabetes on adolescents' daily life, worries related to diabetes, and the burden of the disease and treatment on the adolescent, the researchers asked the adolescents to complete the Child Health Questionnaire and the Diabetes Quality of Life Questionnaire. The Child Health Questionnaire focused on functional health and well being. Cronbach's alpha for the Child Health Questionnaire was 0.80 to 0.94 for this study. The Diabetes Quality of Life Questionnaire used contained three subscales focusing on diabetes-related impact, disease-related worries, and diabetes life satisfaction. Cronbach's alpha for the Diabetes

Quality of Life Scale was 0.88-0.92 showing very good internal validity. Metabolic control was assessed by drawing HbA1c levels (Graue et al., 2005).

The researcher in this study found that adolescents who had diabetes identified more parental involvement and parental control than did adolescents in the group of healthy adolescents and adolescents with physical impairments. The authors believe this is related to the daily challenges of diabetes and the life threatening consequences if diabetes is not managed properly. The researchers also found that the adolescents' perception of parental care, control, and involvement was not viewed as a lower level of care. Multiple linear regression analysis showed that the adolescent's quality of life was improved with a higher degree of parental care and involvement. A high degree of parental care was also found to increase mental health and family cohesion (Graue et al., 2005).

The researcher concluded that parental care, control, and involvement are important factors in the psychosocial health and well being of the adolescent with diabetes. The researchers concluded that a family intervention should have the goal of minimizing family conflict and improving parent-adolescents (Graue et al., 2005).

#### *Benefits of Parental Acceptance on Adolescent Adherence and Metabolic Control*

Parental support is an important factor in successful adolescent diabetes management. Parental support comes in the forms of acceptance and monitoring. This study assessed whether the benefits of mothers' and fathers' accepting relationships with the adolescents regarding diabetes control were due to parental monitoring and how parents together may provide sufficient acceptance and monitoring for diabetes management (Berg et al., 2008).

Participants for the study were recruited from a community-based private practice and a university/private partnership clinic. To be included in the study the adolescents must be between the ages of 10 and 14, have had diabetes for more than one year, lived with their mother, and to read and write in English or Spanish. 185 adolescents along with their mothers were chosen to participate in the study. 145 fathers were also recruited to participate in the study. The majority of the participants of the study were Caucasian with most being in the middle class. The measurement checklists were sent home with the participants to be completed individually and be returned during the next laboratory appointment (Berg et al., 2008).

Parental monitoring of diabetes management was determined by the completion of a diabetes scale developed by the author of this study. The scale was completed by the adolescents and the parents and addressed the six aspects of diabetes care including blood glucose levels, diet, exercise, insulin dosage, insulin injection timing, and testing blood glucose. The parental monitoring scale showed a high rate of reliability for mothers ( $\alpha = 0.86$ ) and fathers ( $\alpha = 0.88$ ). The scale also showed a very high rate of reliability for the adolescents report or mothers' ( $\alpha = 0.90$ ) and fathers' ( $\alpha = 0.91$ ) monitoring. Parental acceptance was measured on the Mother-Father-Peer scale. The Mother-Father-Peer Scale was used to determine the supportive relationship between the adolescents and parents. The internal reliability for the Mother-Father-Peer Scale was also good for all participants (mother  $\alpha = 0.81$ , father  $\alpha = 0.71$ , and adolescent report of mother  $\alpha = 0.72$  and father  $\alpha = 0.83$ ). Self care and diabetes management adherence was measured through a 16 item self care inventory. The inventory was designed by a clinical diabetes educator to assess the adherence to the diabetes plan of care and current diabetes

standards of care over the preceding month. The self care inventory had a good internal consistency as well ( $\alpha = 0.85$ ). The authors of this study evaluated metabolic control from HbA1c levels from the adolescents' medical records (Berg et al., 2008).

The authors of the study conducted hierarchical regression analysis and the Sobel test to determine how adolescents' perceptions of parental monitoring mediate the effect of acceptance on diabetes management adherence and A1C levels. The authors found for the mothers and fathers that acceptance and parental monitoring were indicators of better adolescent adherence and A1C. The authors also found that there was a partial mediating effect indicating that the benefit of mothers and fathers acceptance for adherence was partially due to greater monitoring among more accepting mothers and fathers respectively (Berg et al., 2008).

To determine how the mothers' and fathers' acceptance and monitoring together related to diabetes management, the authors used two hierarchical regressions. The researchers found that fathers' acceptance ( $\beta = 0.24, P < 0.01$ ) and fathers' monitoring ( $\beta = -0.35, P < 0.01$ ) were associated with diabetes management adherence and lower HbA1c levels. The authors conducted further studies to find that low levels of father involvement caused higher levels of HbA1c in the mothers' acceptance and monitoring results, due to mothers carrying the full load of diabetes responsibility with the adolescent. Adolescents' perceptions of mothers and fathers acceptance and monitoring had positive effects on diabetes management and control. However, low involvement of fathers has directly negative effects on diabetes control (Berg et al., 2008).

Parallel analysis was conducted to determine whether parents' reports of acceptance and monitoring had a direct effect on HbA1c and adherence. The authors

found no significant statistics to support that mother's and fathers' reports of acceptance and monitoring on adherence or HbA1c (Berg et al., 2008).

The authors of this study concluded that the parent-adolescent relationship with mothers and especially the fathers are correlated with better diabetes management and metabolic control. The results indicate that measures must be taken to collaborate care with mothers and fathers involve fathers in the diabetes care of the adolescents, such as attending diabetes appointments, taking a more active role in diabetes care tasks (Berg et al., 2008).

*Relationship of Family Structure, Maternal Employment, and Family Conflict with Self-Care Adherence*

Diabetes self care in adolescence is a challenge for adolescents and parents. Previous literature has recommended the transition of care from parents to the adolescents should be a gradual process. However societal changes with single parent household and working mothers may prevent a gradual transfer of care from occurring. The authors of this study investigated whether family structure and maternal employment were associated with diabetes-specific and general conflict and diabetes self care. The authors also studied the relationship of conflict with self-care adherence (Dashiff, Bartolucci, Wallander, & Abdullatif, 2005).

One hundred and sixty-one adolescents with Type 1 diabetes and their parents were chosen to participate in the study from an outpatient endocrinology clinic of a children's hospital in Alabama. To be eligible for the study the adolescents must be between the ages of 11 and 15 years with a diagnosis of diabetes for at least one year, who were able to read and did not have a major behavior disorder that would interfere

with valid protocol completion. To be included in the study the parents also were required to be able to read and to be free of any developmental disability or major psychiatric symptomatology. The majority of the participants were Caucasian from a two parent family (Dashiff et al., 2005).

Data were collected from the parents and adolescents through interviews and checklists. The parents and adolescents were asked to complete the Issues Checklist. The Issues Checklist addresses 44 issues that can cause general conflict between parents and adolescents. Scores were found to be internally consistent. The family was also asked to complete the Diabetes Family Conflict Scale to evaluate conflict in the family regarding diabetes care and how the family negotiates who will be responsibility for diabetes care. The internal consistency reliability, of the Diabetes Family Conflict Scale, for this study, was .83. In addition to the above checklists, the adolescents were also asked to complete the Self-Care Adherence Interview in private away from the parents. This interview was used to assess the adolescents' adherence to self care activities in four different areas. The areas included in the Self-Care Adherence Inventory included dietary behaviors, insulin adjustment, glucose testing, and hypoglycemia preparedness. This interview was performed by young adult research assistants of the same gender and ethnicity of the adolescents being interviewed. The interrater reliability for this interview was moderate ( $r = .68-.71$ ), though interrater reliability was high in the original studies the Self-Care Adherence Inventory was used ( $r = .95 - .98$ ) (Dashiff et al., 2005).

One way analysis of covariance was used to interpret the data obtained from the Diabetes Family Conflict Scale, Self-Care Adherence Inventory, and the Issues checklist. The relationship of family structure and maternal employment was compared with



general and diabetes conflict and self care adherence. The researchers found that three structure family structure groups (2biological parent family, step parent families, and single parent families) did not differ on report of general conflict ( $F(2,134) = 0.08, p = .92$ ), adolescent report of diabetes specific conflict ( $F(2,134) = 0.19, p = .83$ , mother report of diabetes specific conflict ( $F(2,134) = 0.40, p = .67$ ) or self-care adherence ( $F(2,133) = .48, p = .62$ ). The three maternal employment groups also did not differ on adolescent report of general conflict ( $F(2, 134) = 0.20, p = .82$ ), report of diabetes-specific conflict, and self care adherence ( $F(2, 133) = 0.79, p = .45$ ) (Dashiff et al., 2005).

Through this study, the authors found no correlation between mother employment and increased conflict in the family and self care adherence. The researchers also found no correlation between the family structure on diabetes specific conflict or self care adherence indicating that care providers should be aware that alternative family structure and maternal employment, in not detrimental to the adolescents health and to monitor each family closely for conflict regardless of structure (Dashiff et al., 2005).

#### *Family Functioning and Metabolic Control*

Families play a critical role in diabetes care. During adolescence the family is undergoing many stressful changes and can become prone to maladaptive behaviors, which can have a negative impact on glucose control. The purpose of this study was to examine the relationship between family functioning and metabolic control in adolescents with Type 1 Diabetes. The authors sought out to prove that when parents and adolescents view their family as functional, the adolescent's metabolic control will be better than when parents and adolescents view the family as dysfunctional (Leonard, Jang, Savik, & Plumbo, 2005b).

Two-hundred and twenty six adolescents and their parents were chosen to participate in this cross-sectional design study. The participants were chosen from three of the major Diabetes treatment centers in a mid-western state. To be included the sample, the adolescents had to be between the ages of 11 and 18 years of age. The adolescents and parents were asked to complete the questionnaires at a regularly scheduled clinical appointment (Leonard et al., 2005b).

The perceptions of adolescents and parents about family functioning were measured by the authors by using the McMaster Family Assessment Device (FAD). The FAD consists of seven components that affect family functioning. The seven components include problem solving, communication, roles, affective involvement, behavior control, and overall health/pathology of the family. The FAD was found to have a good internal validity score of 0.72. The adolescents of the study were also asked to complete the Youth Self-Report (YSR). The YSR was used to determine problem behaviors in adolescents that may call for additional treatment. These problems include, but are not limited to social problems, attention problems, and delinquent behavior. Metabolic control was determined from HbA1c levels. HbA1c levels were drawn on the adolescents at the clinical visit the data questionnaires were completed. The two previous HbA1c levels were obtained from the adolescents' medical records (Leonard et al., 2005b).

The data obtained in the Family Assessment Device were analyzed by using paired t tests. Associations between the FAD and the Youth Self-Report were analyzed using Spearman's correlation. Logistic regression was used to identify the variables that

were closely associated with higher HbA1c levels. Variables were considered for logistic regression if found to have a  $p < 0.1$  (Leonard et al., 2005b).

The majority of the families who participated in the study had a healthy view of family functioning; however, more adolescents (28%-50%) viewed the family functioning in the household as unhealthy than the parents (11%-38%) who participated in the study. As expected, by the researchers, older adolescents and parents of older adolescents saw more dysfunction in the family. There were several correlations between the adolescents' perceptions evaluated in the FAD, parents' perceptions evaluated in the FAD, and the findings of the Youth Self-Report. The strongest correlations ( $p > 0.35$ ) were found between the adolescents FAD subscale dimensions of roles, affective behavior, behavior control, and general function with attention problems and delinquent behavior (Leonard et al., 2005b).

The authors found no relationship between the level of metabolic control and gender and age at onset of diagnosis; however, the researchers did find a weak link between the level of HbA1c and age of youth ( $r = .18, p = .01$ ) and duration of diabetes ( $r = .14, p = .04$ ). For each year in age a patient was 1.2 times more likely to have a high HbA1c levels. Using the multivariate analysis, the researchers found high HbA1c levels were associated with aggression, attention, delinquent problems older age, and male gender. Attention problems were also found to increase the adolescents' likelihood of high HbA1c by 2.3 times (Leonard et al., 2005b).

The researchers of this study concluded that family is an important factor in adolescent's metabolic control. The researchers determined that the healthier the family relationship is the more likely patient is to have optimal metabolic control. Since greater

family dysfunction was found in older adolescents, it is very important for health care providers to devote more time and help the parents and adolescents to improve family functioning during this difficult time of older adolescence (Leonard et al., 2005b).

*Family Influence on Self-Care, Quality of Life, and Metabolic Control*

Families have a great impact on adolescents' diabetes self care. Adolescents must balance dietary choices, exercise, and insulin dose adjustments to adequately care for their diabetes and achieve successful diabetes management. Family cooperation and interaction is crucial in helping adolescents balance these factors and achieve optimal diabetes management. The purpose of this study was to assess the associations among demographic variables (e.g. age, race, sex, and parental education), family behaviors self-care, quality of life, and metabolic control of glucose levels (Faulkner & Chang, 2007).

The authors of this study chose a descriptive correlational study design. Participants in the study were recruited from a pediatric diabetes clinic of a children's hospital and a nearby affiliated diabetes camp in the mid-south. To be included in the study the participants must have had been diagnosed with diabetes for more than one year and outside of the honeymoon phase, be within one year of the appropriate grade in school to rule out cognitive delays, and free of other chronic conditions such as cystic fibrosis or cancer. A final sample of 99 adolescents was chosen to participate in the study. Approval for the study was obtained from the university's and hospital's institutional review board (Faulkner & Chang, 2007).

The measures the participants were asked to complete in the study consisted of the parental demographic data sheet, the Diabetes Family Behavior Scale, the Self-Care Questionnaire, and the Diabetes Quality of Life for Youth Instrument. The parental

demographic data sheet is comprised of information such as the adolescent's date of birth, sex, race, date of diabetes diagnosis, grade in school, and mother's and fathers' education and family income. Family behavior data was collected by completing the Diabetes Family Behavior Scale (DFBS). The DFBS is a scale that also contains two subscales to determine the adolescent's perception of family support towards diabetes. The two subscales are a guidance-control subscale and the warmth-caring subscale and each address 15 separate items of the total scale. The remaining 17 items of the scale are calculated in the total scale. Cronbach's  $\alpha$  was used to determine the validity of the DFBS. Cronbach's  $\alpha$  coefficients were found to be acceptable for the total scale ( $\alpha = 0.86$ ), the guidance-control subscale ( $\alpha = 0.81$ ), and the warmth-caring subscale ( $\alpha = 0.79$ ). Content validity was also verified through pilot interviews that focused on the adolescent's perceptions on family influence on diabetes care. The Self-Care Questionnaire was used to determine the frequency of the adolescents' involvement in diabetes care. The Cronbach's  $\alpha$  coefficient for the total scale was .78. Content validity was reviewed by a panel of diabetes experts and previous publicized literature on diabetes care. The authors studied the adolescent's Diabetes specific quality of life by using the Diabetes Quality of Life for Youth Instrument (DQOL). The DQOL consists of three subscales including a subscale on diabetes life satisfaction, disease impact, and disease-related worries. The Cronbach's  $\alpha$  coefficient was used to determine validity of the three subscales. The Cronbach's  $\alpha$  for the life satisfaction subscale was .85, the  $\alpha$  for the impact of diabetes subscale was .83, and the  $\alpha$  was .82 was for the worries about diabetes subscale. As in previously mentioned studies metabolic control of the adolescents was determined by the most recent HbA1c (Faulkner & Chang, 2007).

Data Analysis was performed by using several different methods including descriptive statistics, independent t tests, Pearson's correlations and stepwise regression analysis. All tests of significance were determined at an  $\alpha$  level of .05 (Faulkner & Chang, 2007).

The first research question used in this study was: Do age, sex, race, parental education, family behavior, and duration of diabetes predict participation in self-care activities? The researchers found only one significant predictor of participation of self-care. Families who exhibited more positive emotional support and communication had adolescents who participated more in self-care, felt that diabetes had less of an impact of diabetes on every day life, experienced less worries concerning diabetes, and therefore, had a greater life satisfaction (Faulkner & Chang, 2007).

The second research question used in this study was: Do age, sex, race, parental education, family behavior, duration of diabetes, and self-care participation predict quality of life, or metabolic control of glucose levels? The researchers found that the adolescents whose fathers had higher educational levels tended to exhibit better glucose control. The researchers believed this may be related to the families having more financial resources to provide the resources necessary for glucose monitoring and insulin therapy. The researchers found no significant correlation between mother educational level, age, sex, race, duration of diabetes and self-care, quality of life, and metabolic control (Faulkner & Chang, 2007).

The third research question used in the study was: Are there differences in self-care participation, quality of life, or metabolic control based on sex or race? Independent t tests found no significant effects of sex on self-care, quality of life, and metabolic

control. However, there was a suggestion that African American youth expressed more diabetes concerns and worries in the DQOL and subsequently had higher HbA1c levels and poorer metabolic control than Caucasian youth. However, these statistics should be viewed in light that there were not equal numbers of Caucasians and African American youths in the groups and there was a lack of homogeneity in the variances of the mean scores for worries and HbA1c (Faulkner & Chang, 2007).

The fourth research question used in the study was: Is there a relationship between quality of life and metabolic control of diabetes? The researchers found those with poor metabolic control experienced more ill effects. The researchers also found greater worries for those with higher HbA1c. However, the researchers did not find a significant link between better metabolic control and life satisfaction (Faulkner & Chang, 2007).

The researchers found that warm and caring behaviors had a direct impact on adolescent's self-care behaviors, perceptions of fewer worries, lower impact of diabetes on daily life, and greater life satisfaction. These findings illustrate the importance of a positive family environment on diabetes outcomes, which indicates the need for nursing care that will strengthen the family unit and build communication lines for parents and adolescents to work together to make the best decisions to have positive diabetes management that will decrease the occurrence of complications and enhancing the quality of life (Faulkner & Chang, 2007).

#### *Maintaining Parent-Adolescent Teamwork in Diabetes Management*

Teamwork between parents and adolescents during the transition of diabetes management is extremely important to having optimal outcomes. The purpose of this

study was to design and evaluate an office-based intervention aimed at maintaining parent-adolescent teamwork in diabetes management tasks without increasing diabetes-related family conflict (Anderson, Brackett, Ho, & Laffel, 1999).

Young adolescents between the ages of ten and fifteen and their parents were recruited to participate in the study from the Pediatric Unit of the Joslin Diabetes Center in Boston, Massachusetts. To be included in the study the participants must have had diabetes for more than a year, reasonable glycemic control (HbA1c from 6.6% to 10.4%), no major medical or psychiatric illness, reside in New York or New England, have had at least one outpatient appointment in the last year, and be willing to come to the diabetes center for 3-4 visits in the year of the study. 85 families were chosen to complete the study. The study was approved by the Joslin's Committee on human subjects (Anderson et al., 1999).

The eighty-five families chosen to participate in the study were divided in to three groups: The teamwork group, the attention control group, and the standard care group. The team work group consisted of twenty-eight families who participated in 20-30 minute interventions immediately prior to the four clinical appointments scheduled in the year of the study. The interventions consisted of education on promoting teamwork through focusing on parent-teen responsibility sharing and ways to avoid family conflict. The education focused on three key concepts of diabetes including: 1) the multiple causes of high and low blood glucose levels during early adolescence; 2) realistic expectations for blood glucose levels and behaviors during early adolescence; and 3) the importance of parents maintaining involvement with insulin injections and blood glucose monitoring without shaming and blaming the adolescent. The parents and adolescents in



the teamwork group also were asked to develop a responsibility-sharing plan for diabetes tasks and the role of parent involvement and monitor. The responsibility-sharing plan was discussed at and revised at each of the clinical visits. Thirty families were chosen to be included in the attention control group. The attention control group also participated in sessions immediately prior to diabetes appointments which focused on traditional diabetes education. The members of this group were not asked to develop a responsibility-sharing plan. The final group of twenty-seven families was placed in the standard care condition received only routine clinical care during the clinical appointments and no additional intervention. Each of the participants in the study was asked to complete adherence assessments at every visit (Anderson et al., 1999).

Parent involvement in diabetes management, diabetes related conflict, and glycemic control were also examined in this study. Parent involvement data was obtained through interviews which discussed division of diabetes management skills, such as blood glucose monitoring and insulin management amongst the members of the family. Interrater reliability of 94% was found with interviews to determine amount of parent involvement in this study. Diabetes conflict was assessed prior to the educational intervention, as well as twelve months afterwards. The conflict data was measured by the Diabetes Family Conflict Scale, which focuses on the diabetes conflict surrounding seventeen diabetes management tasks. With an alpha rating of 0.90, the Diabetes Family Conflict Scale was found to have excellent internal validity. Conflict was also assessed by the Diabetes Family Behavior Checklist. The Diabetes Family Behavior Checklist assessed the parents' view of the amount of supportive and unsupportive parent responses for the adolescent's diabetes management behavior. Glycemic control was assessed at

the beginning of the study and with each visit to the clinic. Glycemic control was determined by blood HbA1c levels (Anderson et al., 1999).

The first question used in the study was will a brief low-intensity intervention be able to maintain parent involvement in the tasks of diabetes management? The authors found the parents in the teamwork group did not decrease involvement in insulin administration compared to the comparison group. The comparison group showed a significant decrease of 16% in parental involvement in insulin administration ( $X^2 = 4.95$ ,  $df = 1$ ,  $P < 0.03$ ). The authors also found there was no decrease in blood glucose monitoring of the parents who participated in the team work group, compared to an 11% decrease in parents in the comparison group. Therefore, the researchers determined that there was a significant difference in parental involvement of the teamwork group and the comparison group ( $X^2 = 3.17$ ,  $df = 1$ ,  $P < 0.075$ ) (Anderson et al., 1999).

The second question used in study was if parent involvement was maintained over the 12-month study period, can this intervention be used to prevent escalation of diabetes-related family conflict? The greater the involvement of parents in diabetes cares the higher the risk of family conflict towards diabetes management. However, the researchers in this study performed ANOVA analysis of the Diabetes Conflict Scale to determine that there was a significant decrease in diabetes conflict between the family members of the teamwork group at the conclusion of the study ( $F = 4.97$ ,  $df = 1$ ,  $P < 0.02$ ). The comparison group showed no significant decrease in the level of family conflict. ANOVA analysis of the Family Behavior Checklist showed a significantly greater decrease in their behavior than the comparison group. From this data, the authors determined the intervention can reduce family conflict (Anderson et al., 1999).

The final question used in the study was what is the impact of this family intervention on subsequent glycemic control? The authors found that 68% of the teamwork group improved their glycemic control in contrast to the comparison group of adolescents where 47% improved their glycemic control in the twelve months following the completion of the education intervention ( $X^2 = 3.17$ ,  $df = 1$ ,  $P < 0.07$ ). The authors found that the adolescents who were in the teamwork group were 2.4 times more likely to improve their HbA1c level than those in the comparison group ( $P < 0.07$ ) (Anderson et al., 1999).

Through this study the researchers concluded that a low cost intervention program can improve the teamwork of the family and keep the parents involved in the adolescent diabetes care. Another very important finding of this study is that families that worked closely together with more parental involvement did not experience an increase in diabetes related family conflict, indicating that more parental involvement does not have to be associated with more family conflict. Perhaps the most important finding is that families working together and reducing family conflict have a positive effect on patient's metabolic control and improving the adolescent's diabetes outcomes (Anderson et al., 1999).

### *Summary*

Adolescence is a time of transition. For adolescents with IDDM, it is also a time to begin assuming the role for self diabetes management. There are benefits and barriers to this transition for adolescents and parents. The benefits for adolescents are freedom and control. For parents there is the benefit of the relief of the burden for diabetes care. However, as parents are relieved of this burden, the adolescents must accept the burden.

During this time, parents play a key role in helping the adolescents achieve the skills that are necessary for diabetes management. Performance of tasks, decision making, communication, and support are all ways in which parents are involved in the transition. Emphasizing how important the role of parents in adolescent diabetic care is the studies performed by Leonard et al. (2005) and Hanna et al. (2003). These researchers found that the adolescents and parents, who had a relationship based on communication and support, had better metabolic outcomes and therefore are more successful in diabetes self management.

## CHAPTER III: METHODOLOGY

### *Introduction*

The purposes of this study are to describe perceptions of the division of diabetes self- and dependent-care responsibility among young adolescents and their parents in two-parent families and to examine the relationship of these perceptions on metabolic control of diabetes. Dorothea Orem's Self-Care Model will be used to guide this study. This chapter contains the research questions, population, sample and setting, protection of human subjects, procedures, methods of measurement and instrumentation, research design, and methods of data analysis for this study.

### *Research Questions*

1. What is the congruence of perceptions among mothers, fathers, and adolescents with respect to responsibility for diabetes care?
2. What is the relationship between mothers', fathers', and adolescents' perceptions of dependent- and self-care responsibility and metabolic control of diabetes?

### *Population, Sample, and Setting*

Eligible participants for this study will be approached during scheduled visits to a large diabetes practice affiliated with a Children's hospital in the Midwest. The population will consist of adolescents and their mothers and fathers. To be eligible for inclusion in the study the adolescents must be 12-15 years of age, have been diagnosed with Insulin Dependent Diabetes Mellitus for at least one year, and part of a two parent family. To be enrolled in the study the adolescent and both parents must all agree to participate in the study. 75 adolescents and their parents will be approached for inclusion

in the study. With a 60% agreement rate expected, approximately 45 adolescents and their parents will be enrolled in the study.

### *Protection of Human Subjects*

Participation in this study is voluntary. For the protection of the participants of the study, the study will be reviewed by the Ball State University Institutional Review Board as well as the Institutional Review Board for the Children's Hospital with whom the Diabetes Clinic is affiliated. The author of the study will also notify the physicians of the Diabetes Clinic of the purposes and procedures of the study and seek their permission to approach candidates for the study in the waiting room during clinical visits. Verbal agreement to participate will be obtained from the participants for personal interviews, as well as written consent to obtain the last two HbA1c levels from the adolescents' medical records. No risks have been identified with this study. The benefits of the study include gaining knowledge of the family's division of diabetes responsibilities and learning how the divided family roles impact the adolescents' metabolic control of diabetes. Data will remain anonymous. Participants will have the right to discontinue participation in the study at any time.

### *Procedures*

After approval has been received from the Ball State University Institutional Review Board, the Children's Hospital with whom the Diabetes clinic is associated, and the physicians of the practice, the researchers will approach adolescents and their parents at the time of their regularly scheduled diabetes appointments. Once the parents and the adolescents have agreed to participate in the study, a time and place that is convenient for the family will be arranged to conduct the interviews and complete the questionnaires.

All interviews will be set up with in two weeks of the clinic appointment. Parents and adolescents will be asked to complete the questionnaires separately.

### *Instrumentation*

The Diabetes Family Responsibility Questionnaire is a 17 item questionnaire where the mothers, fathers, and adolescents are asked to identify who is responsible for certain aspects of diabetes care. The original instrument was only designed to include the mothers and adolescents; an alternative format was designed to include the fathers as well. The content of the questionnaire was derived from interviews with health care providers, professional diabetes educators and families with diabetic children aged between six and twenty years of age. The internal validity of this study will be estimated by using Cronbach's alpha.

Metabolic Control will be assessed by testing patients HbA1c levels. levels are the percentage of glycosylated hemoglobin in whole blood. levels are considered to be an accurate assessment of patient's glycemic control, because they are not influenced by day to day fluctuations but reflect the overall metabolic control for the previous 6-8 weeks.

### *Research Design*

The design of the study is a descriptive correlational study of family processes, autonomy development, and self-care. A descriptive correlational study is designed to describe variables and examine relationships that exist in a study. In this study, the design was used to assess adolescents, mothers, and fathers responsibility perceptions for illness related care and to assess the relationship between those perceptions and metabolic control of the adolescent's Diabetes (Burns & Groves, 2005).

*Data Analysis*

Upon completion of the Diabetes Family Responsibility Questionnaire, Pearson product-moment correlations will be performed on the scores for each family member (adolescent, mother, and father) for perceptions of diabetes responsibility of each family member. Pearson's product-moment correlations are used to determine the linear dependence between two variables (Burns & Groves, 2005).

*Summary*

The purposes of this study are to describe perceptions of the division of diabetes self- and dependent-care responsibility among young adolescents and their parents in two-parent families and to examine the relationship of these perceptions on metabolic control of diabetes. An anticipated sample of 45 adolescents and their parents will agree to participate in the study and complete the Diabetes Family Responsibility Questionnaire and to have their recorded from the clinical visit at the inclusion of the study and the level of two months prior to inclusion in the study. Pearson's product-moment correlations will be used to analyze the data received from the Diabetes Family Responsibility Questionnaire and levels. The results of this study will help researchers to better understand the role of parental and self-care responsibility has on metabolic control of the adolescent diabetes patient.



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<b>Source (Author, year)</b>	<b>Problem/Purpose/ Research Questions</b>	<b>Framework or Concepts</b>	<b>Sample</b>	<b>Design</b>	<b>Instruments</b>	<b>Results</b>
1. Hanna & Guthrie, 2003	To examine parents' perceptions of their role in adolescent diabetes care. 1. What is the difference in parental involvement in diabetes management as reported by parents of early, middle, and late-stage adolescents with Type 1 diabetes? 2. What is the relationship among various aspects of parental involvement in diabetes management, as reported by parents of adolescents with type 1 Diabetes?	No Theory Identified	31 parents of adolescents with Type 1 diabetes	Descriptive	Diabetes Family Responsibility Questionnaire	Parental involvement in terms of performance of tasks, decision making, support, and communication provide a way for parents to be involved and facilitate adolescent's development of competence in diabetes management responsibility.
2. Leonard	How do teens with	No Theory	18 teenagers	Descriptive	Open ended	5 themes a)

et al., 2005a	higher versus lower HbA1c levels view parents' involvement in diabetes management?	Identified	with IDDM who attended a seminar on insulin pumps	Qualitative Content Analysis	interviews	Gaining freedom and responsibility for diabetes management b) Feeling bothered by parental reminders to manage diabetes c) Closeness of family and parental relationships d) parental monitoring of diabetes e) Teen-parent conflict related to diabetes.  Family communication and conflict resolution skills were strong predictors of type 1 diabetes outcome variables.
3. Hanna et al., 2003	To examine parental involvement in	No Theory Identified	27 adolescents with type 1	Cross-Sectional Descriptive	Independent Functioning in Diabetes	Communication is an integral factor in parental

	<p>terms of communication and support and the relationship of parental communication and support with diabetes management responsibility and metabolic control from the perspective of adolescents with Type 1 diabetes.</p> <p>1. Is there a difference between reported amount and agreement of parent-adolescent communication and between seeking and receiving of parental support for diabetes management as reported by adolescents with type 1 diabetes?</p> <p>2. Is there a</p>		diabetes	Study	<p>Management Checklist, Independent Decision Making in Diabetes Management Checklist, Independent Decision Making in Diabetes Management Checklist, Communication of Diabetes Management Checklists, and the Parental Support for Diabetes Management Checklists.</p>	support of diabetes management.
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	<p>difference in parent-adolescent communication and parental support for diabetes management between early, middle, and late adolescence as reported by adolescents with type 1 diabetes?</p> <p>3. What is the relationship among parent-adolescent communication and parental support with metabolic control as well as adolescent's independent functioning and decision making for diabetes management as reported by adolescents with type 1 diabetes?</p>					
4. Hanna &	To identify	Social	16	Descriptive	Face to Face	Diabetes

Guthrie, 2001	<p>positive and negative dimensions of support related to adolescents' assumptions of diabetes management responsibility from the perspectives of adolescents and parents. 1. What are parents' and adolescents' perceptions of helpful dimensions of support related to adolescents assuming diabetes management responsibility? 2. What are parents' and adolescents' perceptions of nonhelpful dimensions of support related to adolescents' assuming diabetes management</p>	Support Theory	adolescents with insulin dependent diabetes mellitus and parents	Content analysis	interviews	management is better when parents are involved.
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	responsibility?					
5. Hanna & Guthrie, 2000a	<p>To identify adolescents' perceptions that may influence assuming diabetes management from their parents</p> <p>1. What are adolescents perceived benefits and barriers related to assuming diabetes management from their parents?</p>	Health Belief Model	16 adolescents with insulin dependent diabetes mellitus	Descriptive Content Analysis Design	Face to Face interviews	<p>Adolescents perceive the benefit of freedom, but see the burden of responsibility of diabetes management.</p> <p>Parents are perceived to have relief from the burden, but also experience feelings of worry, guilt, and loss of control.</p>
6. Hanna & Guthrie, 2000b	To identify parent's perceived benefits and barriers to transferring diabetes management to adolescence/ What are parent's perceived benefits and barriers related to adolescents assuming and	Health Belief Model	17 parents of adolescents with Type 1 Diabetes.	Exploratory Descriptive Content Analysis Design	Face to Face interviews with questions based on the Janis and Mann classic decisional balance sheet	Positive aspects perceived by parents: parental relief of responsibility but barriers including loss of control and dealing with adolescents management of diabetes.

	parent relinquishing diabetes management during adolescence?					
7. Graue et al., 2005	To explore the role of perceived parental involvement, care and control in relation to self-reported quality of life and metabolic control in adolescents with type 1 diabetes.	No Theory Identified	130 adolescents with Type 1 Diabetes; healthy adolescents and handicapped adolescents were chosen from the general population.	Cross-Sectional comparative study	Parental Bonding Instrument, Parental Involvement Scale, Child Health Questionnaire, and Diabetes quality of life questionnaire.	Parental care, control, and involvement are important factors in the psychosocial health and well being of the adolescent with diabetes.
8. Berg et al., 2008	To assess whether the benefits of mothers' and fathers' accepting relationships with the adolescents regarding diabetes control were due to parental monitoring and low parents together may	No Theory Identified	185 adolescents with Type 1 Diabetes and their mothers, 145 fathers were also chosen for the study	3 year Longitudinal Study Design	Diabetes scale assessing 6 aspects of diabetes care, the Mother-Father-Peer Scale, 16 item self care inventory, HbA1c	Parent-adolescent relationship with mothers and especially fathers are correlated with better diabetes management and metabolic control.

	provide sufficient acceptance and monitoring for diabetes management.					
9. Dashiff et al., 2005	Is family structure and maternal employment associated with diabetes-specific and general conflict with diabetes self-care. What is the relationship between conflict and self-care adherence?	No Theory Identified	161 adolescents with type 1 diabetes and their parents.	2 year longitudinal study	The Issues Checklist, The Diabetes Family Conflict Scale, Self-Care Adherence Inventory	Maternal employment and family structure have no correlation with general or diabetes specific conflict and self-care adherence.
10. Leonard et al., 2005b	To examine the relationship between family functioning and metabolic control in adolescents with Type 1 diabetes.	Adolescent factors and perception of family functioning are related to adolescent's self-perception, and self-perception is related to	266 adolescents with Type 1 diabetes and their parents.	Cross sectional design	McMaster Family Assessment Device, Youth Self-Report, HbA1c	The healthier the family relationship, the more likely patient is to have optimal metabolic control.

		metabolic control.				
11.Faulkner & Chang, 2007	To assess the associations among demographic variables, family behaviors, self-care, quality of life, and metabolic control of glucose levels/ 1. Do age, sex, race, parental education, family behavior, and duration of diabetes predict participation in self-care activities? 2. Do age, sex, race, parental education, family behavior, duration of diabetes, and self-care participation predict quality of life, or metabolic control of glucose levels? 3. Are there differences in	Orem's Self-Care Model	Exploratory Descriptive Content Analysis Design 99 adolescents with Type 1 diabetes	Descriptive – Correlational Study design	Parental Demographic data sheet, Diabetes Family Behavior Scale, Self-Care questionnaire, Diabetes quality of life for youth instrument. HbA1c levels.	Warm and caring behaviors have a direct impact on adolescent's self-care behaviors, perceptions of fewer worries, lower impact of diabetes on daily life, and greater life satisfaction.

	self-care participation, quality of life, and metabolic control based on sex or race? 4. Is there a relationship between quality of life and metabolic control of diabetes?					
12. Anderson et al., 1999	To design and evaluate an office-based intervention aimed at maintaining parent-adolescent teamwork in diabetes management tasks without increasing diabetes-related family conflict./1. Will a brief low-intensity intervention be able to maintain parent involvement in the tasks of diabetes management? 2.	No Theory Identified	85 families of and adolescents with Type 1 diabetes.	Three group randomized treatment design	Diabetes Family Conflict Scale, HbA1c, Parent involvement interviews	A low cost intervention program can improve the teamwork of the family and kept the parents involved in adolescent diabetes care.

	<p>If parent involvement was maintained over the 12- month study period, can this intervention be used to prevent escalation of diabetes-related conflict? 3. What is the impact of this family intervention on subsequent glycemic control?</p>					
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