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Support systems in adolescents with type 1 diabetes mellitus and the relationship to diabetes-related stress, conflict, and metabolic control

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SUPPORT SYSTEMS IN ADOLESCENTS WITH TYPE 1 DIABETES
MELLITUS AND THE RELATIONSHIP TO DIABETES-RELATED
STRESS, CONFLICT, AND METABOLIC CONTROL

by

SAMUEL FOARDE

A thesis in partial fulfillment of the requirements
for the Honors in the Major Program of Nursing
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Thesis Chair: Ms. Jacqueline LaManna

ABSTRACT

The purpose of this integrated review of the literature was to explore the effects of social support on diabetes-related stress, conflict, and metabolic control in adolescents with type 1 diabetes mellitus (T1DM). Social support was examined in four subgroups: adolescents with T1DM, family caregivers, peers, and teachers. Relevant findings in the literature revealed a significant deficiency of research devoted to adolescent males with diabetes as well as fathers as primary and secondary caregivers. Studies highlighted the importance of fostering autonomy and positive self-image in adolescents with T1DM and described effective interventions to improve diabetes-related stress, reduce disease-related conflict, and improve metabolic control. Findings suggested that nurses caring for adolescents with T1DM and their families should foster positive, open communication, while identifying barriers to problem solving, coping, stress, and optimal glycemic control. Interventions that educate caregivers and peers on how to better communicate and provide support are critical in fostering positive psychological and physiological outcomes in the adolescent with T1DM. The findings of this study may provide guidance in the way that nurses assess, identify, and counsel adolescents with T1DM regarding their disease management and access to support systems.

DEDICATIONS

To every person with type 1 diabetes who perseveres with the daily trials and tribulations of managing their condition. Diabetes is a full-time job that none of us applied for and cannot quit.

All of you inspire me to become a wiser patient and nurse.

To all of the family, friends, and healthcare professionals who continue to support me in managing my diabetes. I would not be here without your love, laughter, and commitment to making every day a little sweeter.

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INTRODUCTION

Type 1 diabetes mellitus (T1DM) is a chronic metabolic condition in which the immune system destroys the insulin-producing beta cells of the pancreas (American Diabetes Association [ADA], 2012). T1DM is commonly referred to as juvenile diabetes because the usual age of initial onset occurs primarily during childhood and young adulthood. Also labeled insulin-dependent diabetes mellitus, those diagnosed with T1DM require insulin to sustain life and must self-administer insulin in order to survive. Approximately 215,000 youth under age the of 20 years in the United States were affected with T1DM in 2010 (ADA, 2012). The Centers for Disease Control (CDC) estimates that 15,000 new cases of T1DM are diagnosed in the United States each year (Centers of Disease Control [CDC], 2012). Though T1DM can be diagnosed at any age, the prevalence of T1DM is highest in adolescents between the ages of 15 years and 20 years. Approximately 19 out of every 100,000 children in this age group have been diagnosed with T1DM (ADA, 2012). In 2007, the total economic impact of diabetes, including undiagnosed cases, gestational diabetes and prediabetes, was estimated at \$218 billion; the portion associated with T1DM costs was \$14.4 million (CDC, 2012). Because the onset of T1DM most commonly occurs during adolescence, interventions aimed at effective life-long management are needed for this population.

Effective management of T1DM requires consistent participation in dietary, exercise, and medication regimens. Blood glucose monitoring must be performed throughout the day because activity and diet patterns often fluctuate (ADA, 2012). Maintaining these complex regimens can prove especially difficult for adolescents with T1DM because this age group is concurrently un-

dergoing significant physiological and psychosocial transitions Depression is significantly more prevalent in adolescents with T1DM than in those who are not affected. (ADA, 2012).

Adolescents with diabetes also experience higher rates of recurrent depression than adolescents without this diagnosis (Paterson & Brewer, 2009). These emotional factors also impact adherence to diabetes self-management practices, thereby potentially worsening metabolic control and increasing the risk for developing disease-related acute and chronic complications (Plante & Lobato, 2008).

The period of adolescence is characterized physical, emotional, and psychosocial transitions (Ricci & Kyle, 2009). Because of this, the adolescent age group is particularly vulnerable population in diabetes disease management. During this phase of development, the individual undergoes cognitive progressions that include taking on greater responsibility for actions, crystalizing a sense of self, and developing more complex thought processes (Kail & Cavanaugh, 2012). Increased self-awareness and body image changes contribute to heightened conscientiousness with regard to diabetes self-management activities. Adolescents may not feel comfortable admitting to a chronic condition or performing necessary self-management procedures such as performing blood glucose testing or administering insulin injections while in the company of friends (Jaser & White, 2011).

Social Support

A social support system is a network of individuals that provide encouragement, comfort, and assistance and is involved actively in the life of another individual (Paterson & Brewer,

2009). The dynamics of interpersonal relationships undergo significant transitions during adolescence. A state of disequilibrium occurs as adolescents assert a greater level of independence from parental figures and shift to peer groups as the primary sources of identity construction and social support (Ricci & Kyle, 2009). Addressing the emotional and social needs of the transitioning adolescent in a developmentally sensitive manner is crucial to the proper identification of weaknesses and strengths in the support system (Mulvaney et al., 2011). Furthermore, understanding of the evolving changes in independence and social support is key in identifying factors that influence decision making in chronic disease management.

Stress, Conflict, and Metabolic Control

The health of a family system may positively or negatively impact the individual's self-management efforts. Stress and burnout are commonly experienced by parents of adolescents with T1DM during the transfer to autonomous diabetes care (Berg et al, 2009). One study exploring the effects of diabetes-related stress using the Diabetes Conflict in Families Scale (DFC). Results revealed that families with adolescents diagnosed with T1DM are more likely to experience conflict and discord than those who are not affected by T1DM ($p < 0.005$; Wysocki et al., 2009). Adolescents who experience diabetes-related conflict in the home experience poorer metabolic control (11.3% HbA1c) and higher levels of conflict when compared to those who report lower family conflict (10.7% HbA1c) ($p < 0.05$) (Harris, Freeman & Beers, 2009).

Healthcare providers who counsel clients regarding metabolic control require both tools and knowledge that specifically identify obstacles to effective diabetes self-management. When

counseling families of adolescents with T1DM, educational interventions aimed at promoting caregiver involvement must be approached with sensitivity to the emerging autonomy of the adolescent while also fostering confidence in the self-management competencies of the adolescent. Better understanding of the extent to which access to social support systems influences diabetes-related stress, conflict, and metabolic control will assist healthcare providers to better target educational interventions for adolescents with T1DM and their families (Konradsdottir & Svavarsdottir, 2011). Appreciation of the impact of diabetes-related stress and conflict in families with T1DM may result in development of patient care interventions that can be utilized to improve metabolic control in adolescents.

Problem

Psychosocial obstacles to effective disease management in adolescents with T1DM may stem from an emotional state of disenfranchisement and isolation (Ricci & Kyle, 2009). The demanding set of health practices associated with diabetes self-management can be viewed as socially undesirable or embarrassing, leading adolescents to hide, ignore, or inconsistently manage blood glucose (Carroll, Dimeglio, Stein, & Marrero, 2011).

Ineffective social support may result in higher stress, excessive conflict, and poor metabolic control for adolescents with T1DM. Caregivers, for example, influence adolescent behavior through various parenting styles. Authoritarian parenting styles, which may be too strict, may result in rebellious behavior, whereas permissive styles may result in inconsistent or indifferent behavior (Ricci & Kyle, 2009). Negative reactions from peers may also deter proper diabetes

management by creating stigma and social embarrassment (Hains et al., 2007). Understanding the impact of ineffective social support may be crucial in guiding educational interventions and improving outcomes.

Poor metabolic control greatly increases the risk of developing long-term, diabetes-related complications such as renal disease, neuropathy, retinopathy, myocardial infarction, stroke, and infection (Austin, Sénécal, Guay, & Nouwen, 2011). Poor metabolic control also places adolescents at risk for developing severe hypoglycemia and diabetic ketoacidosis, both acute, life-threatening conditions that require immediate medical attention (ADA, 2012). In an effort to decrease the risk of developing complications, healthcare providers must implement developmentally sensitive interventions to accommodate the psychosocial needs of the transitioning adolescent. The extent of social support from caregivers, peers, and teachers may influence adolescent disease perception and metabolic control will serve as the foci for this literature review.

Purpose

The purpose of this integrated review of the literature was to explore the effects of social support on diabetes-related stress, conflict, and metabolic control in adolescents with T1DM. In this review, social support was examined within the context of three subgroups: caregivers, peers, and teachers. The findings of this study may provide guidance in the way that nurses assess, identify, and counsel adolescents with T1DM and their families regarding disease management and access to support systems. Relevant findings in the literature will serve to guide nurses in educating the patient and family on both the significance and importance of utilizing support

systems. Developmentally targeted education interventions may aid in reducing diabetes-related stress and conflict and ultimately improve metabolic control. In addition, appraisal of the current research will serve as a foundation for further research relating to management of chronic conditions in pediatric populations and may provide foundational knowledge that assists in developing strategies to educate individuals within the adolescents' support system.

Methods

A systematic review of the literature that explored the impacts of social support for adolescents with T1DM was conducted. Articles were gathered from the Collective Index to Nursing and Allied Health Literature (CINAHL), PsycARTICLES, PUBMED, MEDLINE, and Cochrane Database of Systematic Reviews databases. Search terms included were: "adolescent or teen", "diabetes", "type 1", "management", "social support", "metabolic control or glycemic control", "teachers", "friends or peers", "parents or caregivers", and "outcomes." Only peer-reviewed studies that were published within the last ten years were included. Studies conducted and published outside the United States sources were included provided that a complete English translation was available.

This review included studies with samples of participants who were between the ages of 13-18 years and who had been diagnosed with T1DM for at least three months. Gender and ethnicity were considered when interpreting results but did not act as a determining factor for inclusion in this review. Studies were included only if study participants were identified as living with at least one family caregiver.

Studies that focused on participants who were diagnosed with any concurrent chronic disease process other than diabetes were excluded from this review. Additionally, studies that focused on participants who were taking non-diabetes related medications for a period of two weeks or longer were not included in the analysis due the potential impact of medications on blood glucose levels (including herbal, over-the-counter, and illicit drugs).

Articles meeting inclusion criteria were evaluated for quality and applicability to the review. An evidence table was created. Gaps in existing knowledge were identified and recommendations related to practice and research were generated.

FINDINGS

The purpose of this integrated review of the literature was to explore the effects of social support on diabetes-related stress, conflict, and metabolic control in adolescents with T1DM. The search of literature from several databases using the search terms described in the methods section returned 40,680 citations. Of these, 40,622 were excluded as a result of failure to meet inclusion criteria. Twenty-seven peer-reviewed journal studies were used to gather background information on the topic. A consort diagram of the search is provided in Figure 1 (Appendix A). Table 1 (Appendix B) provides a methodological matrix of the eleven research studies analyzed in this thesis. The studies provided data on 1,411 adolescents with T1DM and 822 caregivers and/or caregivers. Samples were gathered from sixteen United States and international sites. Sixty-two percent of the participants were female with a mean age of total participants of 14.7 years. The age range of studied patients was 8-19 years. Studies included one review of literature, 22 survey studies, two semi-structured interviews, and two interventional studies.

Adolescents with T1DM

Seven studies examined the experiences and social support preferences of adolescents with T1DM. Studies under review used both qualitative and quantitative approaches to gather data. Methods included questionnaires, a group intervention, and a tool-efficacy evaluation.

Amer (2008) conducted a study to explore children's adaption toward T1DM. In this study, 31 children with T1DM who were between the ages of 12 and 15 years were administered the

Child Attitude Toward Stress. The CATIS is a brief, self-report instrument that measures children's feelings about having a chronic disease. Results found that metabolic control worsened with age ($r = 0.4275$; $p < 0.05$), whereas attitude toward chronic illness improved as disease duration increased ($r = 0.3663$; $p < 0.05$).

Sato et al. (2008) studied the support preferences of 102 adolescents with T1DM who were between the ages of 10 and 18. Teacher support was examined by the Diabetes Teacher Support Questionnaire (DTSQ). The DTSQ was adapted from the Diabetes Social Support Questionnaire (DSSQ), a 28-item self-report measure of friends' support for diabetes care. It was found that girls preferred actively involved teachers compared to boys ($p < 0.05$; $r = 0.25$), and that perceptions of frequent support as "helpful" decreased with advancing age ($r = 0.02$; $p < 0.05$).

Group interventions may provide clinically significant changes in diabetes-related conflict in adolescent with T1DM (Greco, Pendley, McDonell, & Reeves, 2001). In this study, 119 adolescents with T1DM and their family members participated in a focused group intervention. The average age of participants was 14.5 years. It was found that group interventions could produce clinically significant change in diabetes-related conflict especially in mothers ($p < 0.005$). Mothers dropped an average of 4.4 points on a conflict scale following participation in the intervention, and fathers averaged a 3.1 point decrease. Adolescents with T1DM who participated in the program averaged a decrease of 1.6 points on the conflict scale (Harris, Greco, & Wysocki, 2001).

Researchers tested ecological models of illness management by surveying 96 adolescents with T1DM who were between the ages of 13-17 years. Participants were recruited from an ur-

ban area and were pre-identified as at high-risk for poor metabolic control ($\text{HbA1C} > 8\%$). Each adolescent and his or her parent completed the Diabetes Self-Management Scale (DMS). The DMS includes 18 items that focus on illness-management behaviors, including dietary compliance, insulin injections, blood glucose monitoring, and exercise. It was found that externalizing symptoms have more of an impact on adherence than internalizing symptoms ($p < 0.01$; Naar-King, Podolski, Ellis, Frey & Templin, 2006).

Families and friends of adolescents with T1DM may positively impact adjustment to diabetes and participation in self-management activities. Bearman and La Greca (2002) conducted a study designed to evaluate the Diabetes Social Support Questionnaire (DSSQ). Seventy-four adolescents between the ages of 11-18 years completed the questionnaire. It also was found that female adolescents ($r = 0.78$; $p < 0.05$) perceived greater social support than males ($r = 0.45$; $p < 0.05$) and that friend support facilitates adjustment to chronic disease ($r = 0.67$; $p < 0.05$). Furthermore, families positively impacted certain activities, such as insulin administration, meal planning, and glucose monitoring ($r = 0.75$; $p < 0.04$), whereas friends were more useful in supporting regular exercise ($r = 0.69$; $p < 0.05$).

Non-modifiable factors, such as gender, age and race, may influence dietary self-care in adolescence. Two-hundred and eighty-nine adolescents between the ages of 13-17 years of age with T1DM were administered the Dietary Self-Care Motivation Scale for Adolescents with Diabetes (DSMS-AD) to assess perception of autonomous motivation in disease management. This scale consists of 12 statements that answered the question: “Why do you follow your dietary plan?” Results showed that girls with longer diabetes duration unrelated to age are more likely to ne-

glect their diet ($r = 0.53$; $p < 0.04$), have more complications ($r = 0.43$; $p < 0.05$), and experience poorer metabolic control relative to boys. Also, girls with T1DM are twice as likely to present with eating disorders compared to girls without the disease ($p < 0.005$) (Austin, Senécal, Guay, & Nouwen, 2011).

Peers

Three studies focused on evaluating the impact of peer support in adolescents with T1DM. Studies under review utilized quantitative measures to collect data. Two questionnaire studies and one educational intervention were used.

Helgeson, Lopez, and Kamarck (2009) examined positive and negative associations of friendship to self-care behaviors, well-being, and blood glucose control in adolescents with T1DM. Seventy-six adolescents between the ages of 13 and 16 years were surveyed. Depressive symptoms were measured using the 20-item Center for Epidemiological Studies Depression Scale (CES-D). Adolescents are asked to indicate how often they experienced each symptom in the past two weeks. Results showed that conflict with friends produce greater depressive symptoms ($r = 0.29$; $p < 0.05$) and poorer metabolic control. It also was noted that social conflict had a greater impact on female adolescents ($r = 0.78$; $p < 0.05$) than males ($r = 0.43$; $p < 0.05$).

Integration of peers into the diabetes care of adolescents has been shown to improve adjustment to diabetes. Twenty-one adolescents with T1DM between the ages of 10 and 18 years, and their best friends attended four 2-hour education sessions led by psychologists. The Diabetes Social Support Inventory (DSSI) was used to measure social support. The DSSI is an interview

consisting of ten open-ended questions pertaining to diabetes support provided by family and peers. Following the intervention, the best friends demonstrated higher levels of competence, and the adolescents with T1DM showed improved self-perception higher peer-to-family support ratios (Greco, Pendley, McDonell, & Reeves, 2001)

Hains et al. (2007) examined the relationships between peer reactions to diabetes management and metabolic control. Friend support was assessed using the Diabetes Social Support Questionnaire (DSSQ). The DSSQ is a 28-item self-report measure of friends' support for diabetes care. Metabolic control of the sample was measured using the A1c test and was obtained on the clinic visit during which the adolescents were recruited. One-hundred and two adolescents with T1DM between the ages of 10 and 18 years of age were surveyed. Negative reactions from peers relating to diabetic management resulted in increased difficulty adhering to health regimens ($r = 0.56$; $p < 0.01$). As friend support increased, so did diabetes stress ($p < 0.01$). In addition, teens with higher diabetes stress did not effectively use coping mechanisms ($p < 0.04$) and viewed peer support adversely ($r = -0.25$; $p < 0.04$).

Caregivers

Seventeen studies evaluated the impact of family and caregiver support on the adolescent with T1DM. Both quantitative and qualitative methods were used to collect data. Fifteen questionnaires, two group interventions, two semi-structured interviews, and an integrative review of literature were used to examine this question.

One research study explored the use of behavioral contracts in conjunction with cell-phone monitoring systems and their effects on family dynamics, quality of life, and metabolic control. Ten adolescents between the ages of 14 and 18 years with T1DM participated in the study. The Cornell Parent Behavior Scale was used to measure consequences of parent behavior, and the Helping for Health Inventory was used to measure levels of miscarried helping. Adolescent quality of life was measured using the Varney's Pediatric Quality of Life Scale, and metabolic control was measured using the HbA1c from the clinic charts. Study results indicated that behavioral contracts may be an important adjunct to reduce nagging and improve outcomes with behavioral changes ($p < 0.004$). Glucose testing typically produced the most nagging ($r = 0.41$; $p < 0.05$). Adolescents in the study desired more regular contact with a clinical team ($p < 0.03$; Carroll, Dimeglio, Stein, & Marrero, 2011).

Céspedes-Knadle and Muñoz (2011) developed and implemented a group intervention for adolescents with T1DM and a parallel caregiver support group. Thirty adolescents between the ages of 11 and 17 years with T1DM and at least one caregiver participated in the group session. Researchers measured results using self-report questionnaires collected after the treatment sessions. Following the group sessions, adolescents showed increased diabetes knowledge ($p < 0.05$), personal motivation ($p < 0.004$), social support ($p < 0.03$), and improved metabolic outcomes ($p < 0.05$). In addition, preliminary review of questionnaires showed reduced stress in caregivers and more positive attitudes among teens ($r = -0.47$; $p < 0.005$).

One study used a developmentally-sensitive coping measure to explore how coping strategies impact resilience (quality of life, competence, and metabolic control) in adolescents with T1DM.

Adolescents between the ages of 10 and 16 years of age and their mothers were surveyed. The Responses to Stress Questionnaire assessed coping strategies used by adolescents in response to diabetes-related stressors. The Child Behavior Checklist was completed by mothers to assess their children's competence over the past six months, and the Youth Self Report was completed by the adolescents to assess their perception of their own competence. Quality of life was measured using the Pediatric Quality of Life questionnaire, and glycosylated hemoglobin was obtained from adolescents' medical record. It was found that greater use of primary control coping strategies, such as problem solving and emotional expression, was associated with higher competence scores ($r = 0.43$; $p < 0.04$), better quality of life ($r = 0.36$; $p < 0.04$), and better metabolic control ($r = 0.45$). Secondary control coping strategies, such as acceptance and distraction, were related to higher social competence ($r = 0.34$; $p < 0.05$), better quality of life ($r = 0.54$; $p < 0.05$), and better metabolic control ($r = 0.48$; $p < 0.03$). Finally, the use of disengagement coping strategies including withdrawal and denial was linked with lower competence ($r = -0.35$; $p < 0.05$) and poorer metabolic control ($r = -0.57$; $p < 0.03$; Jaser & White, 2011).

One questionnaire study examined the impact of family on quality of life, adherence to diabetic regimens, and metabolic control. One-hundred, fifty-seven adolescents between the ages of 10 and 18 years were surveyed. The Self-Report Questionnaire on Adherence assesses two types of adherence: behavioral adherence (meals, physical exercise, frequency of insulin administration) and self-responsibility for medical adherence (insulin self-administration, glucose testing). The Diabetes Family Behavior Scale measured affective family support, control and direct support, indirect support, and no support. The Family Environment Scale assessed conflict, cohe-

sion, and family organization, and the Diabetes Quality of Life was used to measure quality of life in adolescents. Results showed that higher family social support was predictive of quality of life in lower class families ($r = 0.87$; $p < 0.05$). Family organization was predictive of quality of life in middle class families ($r = 0.79$; $p < 0.001$), and family conflict was predictive of metabolic control in upper class families ($r = 0.9$; $p < 0.004$; Pereira, Berg-Cross, Almeida, & Machado, 2008).

Dashiff, Riley, Adullatif, and Moreland (2011) explored the feelings and perceptions of parents toward adolescents with T1DM who were preparing to transition into adulthood. Forty parents of adolescents between the ages of 16 and 18 years with a diagnosis of T1DM were interviewed on audiotape. Analysis of the semi-structured interviews revealed that actions which supported self-management included: reminding, granting freedom, stressing complications, fostering responsibility, getting tough, and assuming responsibility for child ($r = 0.57$; $p < 0.003$). Similarly, actions which inhibited self-management included scolding, judging, checking, nagging, and getting emotional ($r = -0.45$; $p < 0.004$).

Another study investigated the perspectives of parents of adolescents with T1DM with regard to their needs for social support related to diabetes management during their child's adolescence. Nine parents of adolescents with T1DM participated in semi-structured interviews and completed surveys. Examination of data obtained from the interviews and surveys revealed that parents of adolescents with diabetes experienced significant needs for social support, specifically in relation to the adolescent assuming primary responsibility for diabetes management. Preferred

sources of support included e-mail or online resources provided by both health care practitioners and other parents of adolescents with diabetes (Paterson & Brewer, 2009).

Another team of researchers investigated the relationship between parental separation anxiety, adolescent self-management, and metabolic control. Twenty-three adolescents with T1DM between the ages of 16 and 18 years and at least one caregiver were surveyed. Both the Parental Separation Anxiety Scale (PSAS) and the Anxiety about Adolescent Distancing Scale (AAD) were used to measure parental anxiety. The Diabetes Self-Management Profile (DSMP) assess self-management skills necessary for glycemic control for patients with T1DM, and metabolic control assessment was obtained from the adolescents' medical chart. Results showed that adolescent self-management tasks were not influenced directly by parental separation anxiety ($r = 0.09$; $p < 0.003$). Fathers with higher separation anxiety had adolescents with better glycemic control ($r = 0.78$; $p < 0.005$). Better self-management was associated with greater glycemic control ($r = 0.56$; $p < 0.005$; Morrison, Dashiff, Abdullatif, & Moreland, 2012).

Vesco et al. (2010) studied the relationship between caregiver responsibility for diabetes management tasks, glycemic control, and blood glucose monitoring frequency. Two-hundred and sixty-one adolescents with T1DM between the ages of 13 and 18 years were surveyed using the Diabetes Family Responsibility Questionnaire (DFRQ). Researchers found that adolescents who perceive greater caregiver responsibility, particularly around direct management tasks, engage in better diabetes management ($r = 0.61$; $p < 0.005$).

A study surveying 23 families was conducted to study adaptation and coping strategies of parents who had adolescents with diabetes. Participants were involved in a short-term education

and support intervention. Data were collected using the Coping Health Inventory for Parents (CHIP). Results from the CHIP revealed that a positive correlation existed between income and mothers' adaptation ($r = 0.41$; $p < 0.05$). Additionally, researchers described a discrepancy in how mothers and fathers perceive communication with health care professionals. Mothers reported that talking with health professions was helpful, whereas more than half of fathers in the study did not ($p < 0.004$). Further examination between genders indicated that mothers cope by helping the child manage the illness, whereas fathers cope by distancing themselves from stress ($p < 0.02$) (Konradsdottir & Svavarsdottir, 2011).

Plante and Lobato (2008) conducted a review of the literature to explore the efficacy of group-based interventions. Criteria for literature selection included interventions that were designed to improve psychological adaptation, adherence to the treatment regimen, and diabetes-related medical outcomes in children and adolescents with T1DM. Findings from this review of the literature suggested that structured, more behaviorally focused programs provide positive effects on emotional adjustment. Group sessions were useful in resolving family conflict and appeared to improve diabetes-related adjustment. A disproportionate number of study participants were drawn from Caucasian families from middle class backgrounds.

Wysocki et al. (2009) explored the relationships between T1DM outcomes (adherence, glycemic control, quality of life, family conflict, depression, and self-efficacy) and scores on the Collaborative Parent Involvement (CPI) Scale. Three-hundred adolescents between the ages of 9 and 15 years with a diagnosis of T1DM and their primary caregivers were surveyed. Mothers constituted 90% of the primary caregivers, whereas 90% of secondary caregivers were fathers.

Analysis of the data indicated that adolescents who perceived that both caregivers demonstrated low collaborative involvement in diabetes management were consistently at-risk of poor metabolic control ($\text{HbA1c} > 9\%$; $r = 0.68$; $p < 0.005$). Conversely, high collaborative involvement of the primary caregiver appeared to be especially significant in maintaining self-management ($r = 0.57$; $p < 0.05$). Finally, there was modest evidence that greater involvement of the secondary caregiver may have yielded some additive benefits beyond the contributions of the primary caregiver ($r = 0.49$; $p < 0.05$).

One team of researchers examined the effects of a structured family therapy approach on parent-adolescent conflict in adolescents with poorly controlled diabetes. Eighteen adolescents with T1DM between the ages of 13 and 18 years and their caregivers participated in the treatment group. Families participated in ten 90-minute role-playing sessions over the course of five to eight weeks. Caregivers who participated in each session included step-mothers and step-fathers, single mothers and fathers, grandparents, and other adult family members. Treatment consisted of four therapy components that are used in accord with each family's needs as identified by their responses to the questionnaires completed at baseline: problem-solving training, communication skills training, cognitive restructuring, and functional/structural family therapy. Data collected following group participation indicated that treatment sessions improved diabetes-related conflict between mothers and adolescents ($p < 0.003$; Harris, Freeman, & Beers, 2009).

Mackey et al. (2011) evaluated the interrelationship of family cohesion with disease self-management and metabolic control. Two-hundred and fifty-seven adolescents with T1DM between the ages of 11 and 14 years and at least one caregiver were interviewed. Youth participants

completed the Youth Self Report, a behavior rating scale assessing general emotional and behavioral functioning, and the Positive Qualities sub-scale (YSR-PQ), which investigated desirable personal characteristics, such as “I think I’m pretty friendly.” The Cohesion sub-scale of the Family Environment Scale examined the adolescents’ perceptions of their family’s cohesiveness. The Diabetes Behavior Rating Scale (DBRS) assessed management of diabetes care. Blood glucose monitoring was assessed via self-report from both adolescents and parents by describing self-management tasks performed over the past 24 hours. Ninety-two percent of family caregivers were mothers. Family cohesion related to family involvement in management ($r = 0.56$; $p < 0.05$), and positive attitudes in youth may enhance ability to draw more social support, thus improving control ($r = 0.34$; $p < 0.07$).

Another study examined the association between perceived coping effectiveness and diabetes self-management. Two-hundred and fifty-two adolescents between the ages of 10 and 14 years with T1DM and their mothers participated in structured interviews to identify stressful diabetes events. The Children’s Depression Inventory examined the extent to which the child experienced depressive symptoms in the past two weeks. The Self-Care Inventory assessed adherence to the diabetes regimen over the preceding month. The Self-Efficacy for Diabetes Management Scale assessed the adolescents’ confidence in being able to manage diabetes across problematic situations, and glycosylated hemoglobin levels were obtained from clinic visits over the preceding three months to assess metabolic control. Findings indicated that mothers were more likely than fathers to participate in caregiving behaviors ($p < 0.03$). Active involvement did not always result in lower stress appraisal ($r = 0.11$; $p < 0.05$), and higher perceived coping effectiveness was

associated with lower depressive symptoms ($r = -0.45$; $p < 0.04$), better adherence ($r = 0.67$; $p < 0.04$), and lower HbA1C ($r = -0.56$; $p < 0.05$). In addition, collaborative diabetes management between caregivers and adolescents was associated with more effective coping when stress was viewed as shared and less effective when stress was viewed as “mine” ($r = 0.67$; $p < 0.05$; Berg et al., 2009).

Haugstvedt, Wentzel-Larsen, Graue, Søvik, and Rokne (2010) examined the relationship between parental fear of hypoglycemia, the prevalence of hypoglycemia, diabetes treatment factors, and emotional distress in mothers and fathers in parents of adolescents with T1DM. One-hundred and fifteen adolescents between the ages of 10 and 15 years were surveyed. Findings revealed that caregiver perceptions influence fear more than objective indicators of hypoglycemia. Greater worry was associated with the younger age of a child ($r = -0.65$; $p < 0.04$). Mothers ($r = 0.7$; $p < 0.005$) displayed greater fear than fathers ($r = 0.34$; $p < 0.005$), and higher hypoglycemia worry was associated with higher emotional distress ($r = 0.34$; $p < 0.005$).

Ivey, Wright, and Dashiff (2009) explored the ways that parents and adolescents with T1DM communicate and identified recurrent themes and patterns of behavior related to diabetes management. Twenty-eight adolescents between the ages of 11 and 15 years with T1DM and their caregivers participated in semi-structured interviews. Adolescent anger and frustration centered on the need of the child to have choices, make decisions, and receive recognition for positive aspects of their diabetes management. Parents expressed the underlying fear of harming or losing the adolescent because of some error or misjudgment in disease management. Parents also had difficulty entrusting self-care tasks to their teens and relying on them to be honest about their

blood glucose readings. Comments from the interviews led to a discussion about learning to see diabetes as normal for that adolescent and the family.

One study investigated parents' and adolescents' perceptions of helpful and non-helpful support specific to adolescents' assumption of responsibility for diabetes management. Sixteen adolescents between the ages of 11 and 18 years of age with T1DM and their caregivers participated in semi-structured interviews. Based on perceived need of guidance, autonomy-seeking teens found helping behaviors intrusive. Second, management was better when parents were involved. Finally, it was important for parents to listen, explain, and openly negotiate. The impact of parenting styles on diabetes management also was examined. Authoritative parenting styles were described as crucial for positive growth and non-tangible assistance was viewed as helpful by teens, whereas tangible assistance was not. Conversely, non-directive assistance was viewed as helpful by parents, whereas directive support was not (Hanna & Guthrie, 2001).

Teachers

The review of literature was very limited with respect to the role of teacher support in relation to adolescents with T1DM. Only one survey study evaluating social support from teachers was found. One-hundred and twenty-three adolescents with T1DM between the ages of 10 and 18 years with T1DM were surveyed. Teacher support was examined by the Diabetes Teacher Support Questionnaire (DTSQ). The DTSQ was adapted from the Diabetes Social Support Questionnaire (DSSQ), a 28-item self-report measure friends' support for diabetes care. Results indicated that teachers who were more engaging were perceived as more supportive ($r = 0.57$; $p <$

0.05), and those who respected privacy were perceived as least supportive ($r = 0.25$; $p < 0.05$).

In examining difference between genders, girls preferred actively involved teachers as compared to boys ($p < 0.05$). In addition, perceptions of frequency as “supportive” was found to decrease with increasing age ($p < 0.05$; Sato et al., 2011). Understanding the impact teachers have on diabetes-related stress, conflict, and metabolic control could guide educational interventions on how to better incorporate school staff in diabetes management. For example, female adolescents of a younger age may be more likely to perceive involved teachers as helpful, which could more appropriately guide teacher involvement with adolescents in this demographic.

DISCUSSION

The purpose of this review of the literature was to explore the effects of social support on diabetes-related stress, conflict, and metabolic control in adolescents with T1DM. This section will discuss the findings of the literature review as they relate to adolescents with T1DM, caregivers, peers, and teachers.

Adolescents with T1DM

Seven studies focused primarily on the experiences of adolescents with T1DM. Studies that examined coping patterns in adolescents with T1DM grouped coping behaviors into positive and negative categories. Positive behaviors such as problem solving, emotional expression, positive thinking, acceptance, and maintaining a sense of normalcy were associated with lower scores on stress questionnaires. Coping behaviors classified as negative included disengagement, denial, avoidance, and wishful thinking and were associated with higher stress scores (Jaser & White, 2011). Studies examining the effect of disease duration on diabetes management found a correlation between longer disease duration and poor metabolic control and positive associations between disease duration and positive attitudes toward diabetes (Amer, 2008).

Adolescents with T1DM prefer to have choices, make independent decisions, and receive positive feedback for good decisions related to self-care. Adolescents who reported higher autonomy were more likely to find supportive behavior intrusive and controlled their diabetes better than those who displayed less autonomy (Hanna & Guthrie, 2001). The needs of each ado-

lescent are unique. Adolescents require a “goodness of fit” with regard to their preferred support from teachers; the adolescents’ perceived need for support plays a role in which behaviors are considered effective (Sato et al., 2008). Adolescents require social support from various sources, including caregivers, peers, and teachers in order to achieve effective diabetes self-management practices and long and short-term disease-specific outcomes (Austin et al., 2011).

Adolescent females with T1DM appear to be at higher risk for poor metabolic control and social outcomes when compared to their male counterparts. These findings are likely related to the increased emphasis female adolescents put on social input. Females with longer diabetes duration are more likely to neglect their diet, possibly due to greater preoccupation with body image during adolescent years when compared to males. Adolescent females with diabetes were twice as likely to develop eating disorders, including anorexia and bulimia, when compared to unaffected peers. Researchers suggested that this may be due to higher expectations for girls with diabetes with regard to dietary management (Austin, Senécal, Guay, & Nouwen, 2011).

Caregivers

Seventeen studies evaluated the impact of family and caregiver support on the adolescent with T1DM. An adolescent’s perception of family support decreases with advancing age, thereby making it prudent to encourage caregiver involvement at earlier stages of adolescence. Better diabetic management occurs when caregivers are more involved, and poorer outcomes, such as depression and poor glycemic control, arise when caregivers are less involved (Bearman & La-Greca, 2002).

The parenting style of one or both caregivers impacts the self-management behaviors of adolescents with T1DM. Adolescents whose caregivers exhibit authoritarian, or very strict parenting styles, often report higher stress and poorer metabolic control (Hanna & Guthrie, 2001). Those whose caregivers exhibit permissive caregiving report lower stress but poor metabolic control. A balance of rule setting and granting freedom, often referred to as authoritative caregiving, yields the most positive results. Adolescents with authoritative caregivers report lower stress and better glycemic control than control groups (Céspedes-Knadle & Muñoz, 2011).

Certain caregiver behaviors have been shown to promote or inhibit self-management behaviors in diabetic adolescents. Directive behaviors, such as nagging, scolding, judging, checking, confronting, and getting emotional, were associated with higher adolescent stress and poorer metabolic control. Non-directive behaviors, such as fostering responsibility, reminding, and granting freedom, were associated with lower adolescent stress and greater metabolic control (Dashiff et al., 2011).

A positive family environment has been shown to be protective in the transition years from adolescence into adulthood (Mackey et al., 2011). External factors, such as socioeconomic status, can influence household stress and impact metabolic control in the adolescent. Correlations were found between higher household incomes and lower reported adolescent stress (Konradsdottir & Svavarsdottir, 2011). Internal factors such as family cohesion and responsibility sharing also have been correlated with stress and metabolic control. Caregivers and adolescents who scored higher on cohesion scales also engaged in more frequent diabetes management behaviors (Mackey et al., 2011). In addition, adolescents who perceived management of stress as shared

with caregivers displayed greater positive coping behaviors when compared to adolescents who felt they dealt with stress by themselves (Berg et al., 2009). It should be noted that, while caregiver involvement was associated with more positive management behaviors, involvement did not always result in lower adolescent stress (Wysocki et al., 2009).

Dynamics between caregivers also should be considered when addressing management in adolescents with diabetes. In the research reviewed, mothers most commonly functioned as primary caregivers in the home and were consequently the subject of the majority of research in this area (Harris, Freeman, & Beers, 2009). Surveys of mothers and fathers revealed distinct differences in coping mechanisms when dealing with diabetes-related stress. For example, the majority of mothers coped with stress by actively managing their child's diabetes, whereas fathers were found to cope by distancing themselves from diabetes-related stressors (Konradsdottir & Svavarsdottir, 2011). Mothers in their roles as primary caregivers assume most of the diabetes management responsibility. Because of their greater role in caregiving, mothers perceived greater diabetes-related fears, specifically related to hypoglycemia, when compared to fathers. Fathers who cope by distancing themselves from stressors can pose a threat to effective adolescent self-management. One study revealed that collaborative efforts of both caregivers outweigh the sum of both individually (Haugstvedt et al., 2010).

Managing conflict within the home setting can be crucial in lowering stress and improving outcomes of adolescents with T1DM. Households that reported higher levels of diabetes-related stress also reported higher levels of conflict, which in turn raised diabetes-related stress. Conse-

quently, poorer metabolic control has been noted in adolescents who live in households with higher stress and conflict (Naar-King, Podolski, Ellis, Frey, & Templin, 2006).

Anxieties related to the transfer of self-management responsibilities to adolescents can impact household stress and caregiver adjustment to adolescent diabetes. Caregivers report fear and anxiety when entrusting adolescents to maintain adequate self-care behaviors, including blood sugar testing, diet choices, exercise, and medication administration. Parental caregivers express the need for emotional support from both healthcare providers and other caregivers of adolescents with T1DM to cope effectively with diabetes-related stress in the home (Ivey et al., 2009).

Peers

The average adolescent spends the majority of the day in school and social settings. Interactions with friends and peers occur on a daily basis making peers integral in the social support structure of adolescents. Research has indicated that friends are an indispensable component of emotional support during adolescence (Fernandes, Wales, Crisp, & Kyngas, 2011). As age increases, adolescents perceive greater support from friends than family members, such as caregivers or siblings (Helgeson, Lopez, & Kamarck, 2009). Three studies in the literature review focused specifically on the impact of peer support on adolescents with T1DM. Friend support was shown to have positive associations with healthy disease perception and feelings of normalcy (Ivey et al., 2009). Friend support may not always yield positive results. One study revealed that

increased friend support also increased adolescent stress and worsened metabolic control (Hains et al., 2007).

Interventions aimed at educating friends and other peers may produce positive effects in adolescent diabetes disease management. In one interventional study, adolescents with T1DM and their best friends participated in a series of education sessions that included content on problem solving, interventions, signs and symptoms, and other components of diabetes self-management. The results revealed a positive association between diabetes-related education in peers and adolescent self-concept and a decrease in family conflict (Plante & Lobato, 2008).

Just as positive interactions with peers can facilitate improved outcomes in adolescents with T1DM, negative peer interactions with may yield the opposite effect. Conflict with friends has been associated with poor metabolic control, worsening self-care, and more severe depressive symptoms. In addition, poor self-management behaviors were associated with more frequent negative peer interactions (Hains et al., 2007). Positive and negative peer interactions do not seem to carry equal weight in terms of diabetes self-management behaviors. One survey study concluded that negative interactions have longer lasting effects than positive interactions on diabetes management, stress, and perceived support (Helgeson, Lopez, & Kamarck, 2009). Evaluating stress in the adolescent with diabetes may prove useful in social contexts; adolescents with higher stress levels did not employ the use of peer support as frequently as adolescents who reported less stress (Bearman & LaGreca, 2002).

Gender differences in adolescence play a key role in socialization and perceived support. Female adolescents respond to social input to a greater extent than male adolescents (Austin,

Senécal, Guay, & Nouwen, 2011). Conflict may be more normative in male socialization (Helgeson, Lopez, & Kamarck, 2009). One survey of adolescents with diabetes who were involved in romantic relationships suggested that treatment adherence in male adolescents was increased by social support from a significant other, whereas adherence in female adolescents were unaffected (Pereira, Berg-Cross, Almeida & Machado, 2008).

Teachers

Teachers are also a consistent presence in the adolescent social structure. Most schools average about six to seven classes within a day, each class facilitated by a different instructor. With such consistent frequency of adolescent-teacher interactions, studies have been conducted evaluating the effects of diabetes-related teacher support on adolescents with T1DM. One survey study examining the support preferences of adolescents with T1DM displayed preference differences between genders. Female adolescents preferred actively involved teachers more than male adolescents. Females also perceived a great amount of support from teachers in general when compared to males. Frequent teacher support also was seen as less supportive as the adolescent age increased (Sato et al., 2008).

LIMITATIONS

A disproportionate amount of research focused on females with T1DM. Factors relating to social needs of male adolescents were not addressed consistently in sample descriptions. Factors such as involvement in sports, school performance, emerging sexuality, family structure including number of male and female siblings, birth order, and age may potentially impact diabetes management, stress, adherence, and metabolic control and were not discussed typically in sample descriptions of the reviewed studies. Some studies failed to differentiate between treatment modalities. The type of insulin therapy, such as pump-therapy or multiple injections has the potential to affect adherence, stress, and social perception of diabetes. Finally, adolescent sexuality was never mentioned in any of the reviewed studies, which may influence family and social dynamics, body image, complications during pregnancy and ability to cope.

Sample sizes in reviewed studies were consistently small. Although most studies were quantitative in nature, most did not utilize large samples; larger numbers could enhance generalizability and reliability to findings.

Perhaps the most consistent limitation in the research studies on adolescent diabetes was the limited time period allocated for follow-up in interventional studies. Diabetes is a chronic condition that fluctuates along with the patient lifestyle. Because data are collected from only a few points, it is not feasible to draw pertinent conclusions on the sustainability of intervention-related outcomes for adolescents. Glycemic control, for example, could be impacted directly by a targeted interventions or environmental factors. It is not known how metabolic control or self-management behaviors are impacted by gradual changes in an individual's life. Longitudinal

studies are needed to facilitate follow-up studies in evaluating fluctuations in attitude, perception, stress, coping, adherence, and metabolic control.

Limitations in the literature include the failure to incorporate external factors that may impact family dynamics and functioning. Some studies did not address external factors such as household size, single-caregiver homes compared to dual caregivers, same sex couples as caregivers, race, and ethnicity. The level of education each caregiver had attained often was omitted. These factors may affect the family income, household stress, caregiving style, and glycemic control of the adolescent. Most samples included predominantly Caucasian participants who were of higher than average socioeconomic status. Failing to incorporate participants from varying financial and racial backgrounds significantly impacts the generalizability of findings and, therefore, the efficacy of planned interventions. When collecting data in the questionnaire study, many researchers chose to take report from either the adolescent or the caregiver, but rarely both. Creating a complete clinical picture of the findings requires that input from both parties, as both adolescents and caregivers perceive and process events differently, again impacting the reliability of the data.

A prominent limitation in the caregiver literature was the disproportionate focus on mothers as caregivers. Although mothers principally serve as primary caregivers for adolescents, the role of fathers as secondary and even primary caregivers was neglected typically. There was little information describing the barriers to father involvement as caregiver and effective interventions to promote more active involvement. Other gaps in the literature included maternal attitudes towards fathers regarding responsibility sharing in the care of diabetic adolescents. Siblings as ex-

ternal factors also lacked a body of research. Little was discovered regarding siblings' impact on adolescent coping, stress, adherence, or disease perception.

Limitations were also present in the studies relating to peer involvement in diabetes support. Most studies failed to identify the effects of peers of varying ages, races, and genders in relation to the diabetic adolescent. Peer studies did not differentiate support provided by long-term friends from that of short-term friends. Peer support provided by friends who also cope with chronic disease, such as other adolescents with diabetes, was not differentiated from that of otherwise healthy individuals. Friends who experience similar self-consciousness, stress, and lifestyle modification may greatly influence diabetic adolescents' stress and coping. Finally, the issue of academic performance is also an intriguing external factor that could be considered. Peers who are perceived to achieve higher or lower academically may wield varying influences on adolescents, depending on age, gender, and ethnicities as internal factors.

Research focusing on the role of teachers in diabetes support omitted some key points. Studies failed to include the effects of teacher age, gender, and ethnicity and the impact on adolescent perception and preference of support. Also, the literature did not address the issue of support during the progression to subsequent grades such as the move from junior high school to high school. The issue of communication between teachers relating to diabetes support is also raised, calling into question the importance of team efforts within the school system without being perceived as overbearing or intrusive.

RECOMMENDATIONS FOR NURSING

Practice

Adolescents are high-risk for poor metabolic control and the acute and chronic diabetes complications that may result from poor diabetes self-management practices. Nurses should assess for poor glycemic control in adolescents as well as signs of acute and long-term decline in metabolic control. A1C levels are a measure of three-month metabolic control and typically receive the highest priority when evaluating the effectiveness of diabetes-focused interventions (ADA, 2012). In addition, female adolescents should be assessed for the presence of eating disorders due to their increased prevalence in female adolescents with diabetes (Austin, Senécal, Guay, & Nouwen, 2011). Apart from physical assessment, the current literature suggested that nurses are critical in assessing psychological, emotional, and social dynamics of the patient and family. Screening for psychosocial barriers, such as diabetes-related stress and conflict, can build a more complete clinical picture to guide individualized client and family interventions.

Caregivers and adolescents should be educated on the most effective ways to problem-solve, communicate, negotiate, and give mutual support regarding diabetes management (Hanna & Guthrie, 2001). First, open and honest communication should be encouraged between adolescents and caregivers. Sharing perceptions of responsibility, identification of illness and social stressors, and effective problem-solving may encourage negotiation of healthy behavior contracts (Carroll, Dimeglio, Stein, & Marrero, 2011). Education of caregivers on how to avoid harmful communication, such as lecturing, getting emotional, and confrontation and effective

parenting skills is crucial. Rule-setting, fostering of independence, and provision of positive feedback is critical in optimizing self-management skills (Dashiff et al., 2011). Caregivers should be encouraged to increase the perception of shared responsibility with the adolescent because this has been shown to improve adolescent outcomes (Vesco et al., 2010). Group interventions that involve networking and shared experiences with other T1DM adolescents and their caregivers have been shown to be more effective than one-on-one therapy in enhancing coping, problem-solving, conflict reduction, and glycemic control (Greco, Pendley, McDonell, & Reeves, 2001).

Fathers, if present, should be encouraged to become more active in the diabetes management process. Fathers who actively participate as an adjunct caregiver experience less diabetes-related stress, enhanced adaptation to the disease, and less frequent conflict (Konradsdottir & Svavarsdottir, 2011). Caregivers should be aware that levels of support differ for adolescents of varying autonomy. Nurses should assist caregivers in finding “goodness of fit” for their adolescent; avoiding overbearing behavior may reinforce positive feelings of management, and consequently improve outcomes (Berg et al, 2009).

Nurses should also be aware that poor provider satisfaction has been associated with poor adherence to diabetic regimens (Naar-King, Podolski, Ellis, Frey, & Templin, 2006). Nurses are instrumental in ensuring that questions are answered, that concerns are understood and addressed, and that the emotional needs of both caregiver and adolescent are met.

Research

Gaps in the current body of literature suggested that there is a need for nurses to engage in further research in the area of social support interventions for adolescents with T1DM. There is a need to better understand the impact of various diabetes treatment modalities such as insulin delivery on adolescent stress and adherence to diabetes self-management practices. Efforts should be made to ensure that disparities in the diabetes literature with respect to gender of adolescents with T1DM are addressed. Obtaining histories and interval reports from both caregivers and adolescents creates a more complete clinical picture of perceived support. Personal factors such as adolescent sexuality require further exploration as potential stressors and barriers to effective disease coping. External factors, such as socioeconomic status, may act as predictors for glycemic control, coping ability, and adherence in adolescents and need to be better understood (Naar-King, Podolski, Ellis, Frey, & Templin, 2006).

The dynamics of the family environment of adolescents with T1DM requires more extensive study. Factors such as household size, family structure, same-sex caregivers, ethnic identity, age and gender of caregivers may play a significant role in adolescent adherence and disease perception. Socioeconomic factors, such as family income and education level of caregivers, may be predictive of household stress and coping mechanisms for both caregivers and adolescents. Research is sorely needed regarding the role fathers as caregivers. Barriers to active participation, such as social norms, fears, motivation, coping style, family history, and race need to be better

understood in order to facilitate the role of fathers as active participants in diabetes care (Konradsdottir & Svavarsdottir, 2011).

Studies investigating attitudes of mothers towards responsibility sharing with fathers may unearth correlations to household stress and caregiving adaptation. The presence of siblings in the household should be evaluated for impact on adolescent coping and stress. Variables including age, gender, health status, and birth order may have an effect on disease perception and general diabetes management. Researchers should strive to ensure the generalizability of findings by collecting samples from a variety of sources. Many studies draw from predominantly Caucasian samples with higher than average socioeconomic status, which may not be applicable to patients of varying races, incomes, and environments.

Research evaluating the effects of peer support on diabetes management will aid in the development of age-appropriate psychosocial interventions. Duration of friendships may influence stress, coping, and perception of diabetes support. Demographic factors, such as race, gender, ethnicity, and perceived academic performance, also may play a role in resiliency behaviors. Peers who cope with similar chronic diseases may provide unique support in diabetes management. Fostering solidarity between affected adolescents will likely increase positive disease perception and reinforce adherence.

Studies examining personal characteristics of teachers in relationship to outcomes of adolescents with T1DM are needed to optimize social support in this age group. Models that support adolescents as they move from single classroom to multiple classroom environments require additional study.

SUMMARY

Understanding the impact of social support on adolescents with T1DM may be crucial to formulating appropriate psychosocial interventions that optimize client outcomes. Based on the information gathered from this review of literature, it can be concluded that individualized psychosocial interventions may be effective in improving diabetes-related conflict, stress, and metabolic control in adolescents with T1DM. Studies have shown that implementation of group educational therapy reduces diabetes-related stress and conflict in caregivers and improves adherence in adolescents with T1DM, thereby improving metabolic control. Similarly group interventions have been shown to be effective in improving peer competency in diabetes-related care, consequently reducing diabetes-related stress for adolescents with T1DM in social situations. The extent to which fathers play a role as primary caregivers in diabetes-related care of the adolescent still remains unclear and requires further study.

Nurses are crucial participants in the education of caregivers, peers, and teachers in appropriate support interventions. Proper assessment of the individual support needs of the adolescent with T1DM is key in reducing diabetes-related stress and conflict as well as improving metabolic control. Screening the family for conflict and stress related to diabetes management can help guide interventions aimed at improving communication between caregivers and reducing stress and conflict. In their roles as patient advocates, nurses should be participate in research that explores the special psychosocial needs of male adolescents with T1DM, the roles of fathers as primary caregivers, and the long-term effects of disease-specific psychosocial interventions.

Nurses must approach the social support system of adolescents with T1DM as an invaluable resource in promoting positive short-term and long-term client outcomes. Utilizing appropriate interventions with caregivers, peers, and teachers creates a “team-effort” in supporting greater metabolic control.

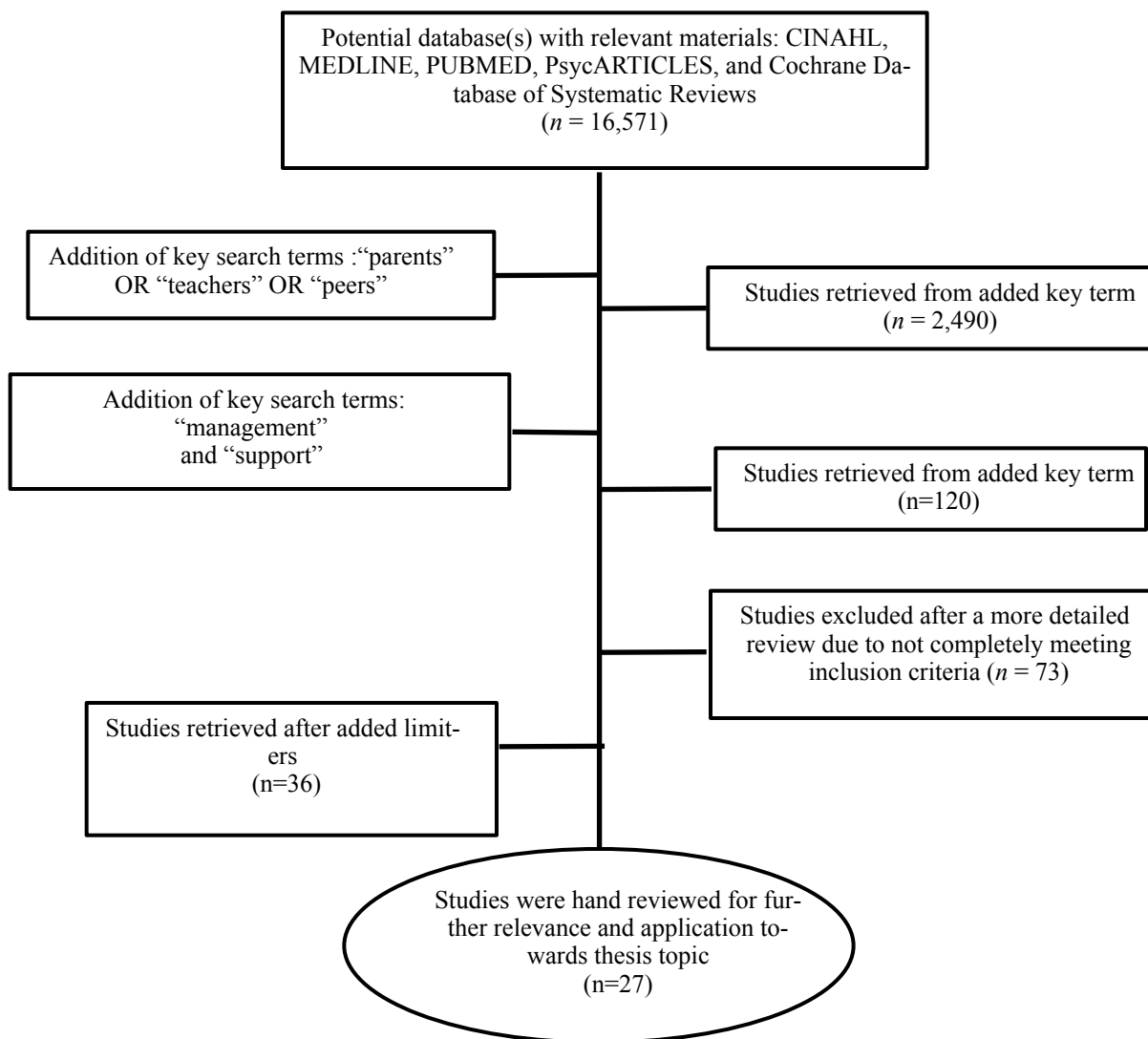
APPENDIX A: SELECTION METHOD OF LITERATURE

Figure 1. Selection Method of Literature

Flow Diagram of Study Selection Process

Key Search Terms = adolescen*, diabet*, management, support, parent*, teacher*

Limiters = English language, peer reviewed, published within last 10 years, participants must between 13 and 18 years of age, living with at least one caregiver, have no additional disease processes, or be taking any medication outside of those used to manage diabetes.



APPENDIX B: TABLE OF EVIDENCE

Table 1. Table of Evidence

Inclusion Criteria: Inclusion criteria for this review comprised studies with participants between the ages of 13 to 18 years who had been diagnosed with T1DM for at least three months. Gender and ethnicity were considered when interpreting results but did not act as a deciding factor for inclusion. Study participants must have been living with at least one caregiver.

Exclusion Criteria: Studies that focused on participants who were diagnosed with any ongoing disease process while involved in the study (except T1DM) were excluded from this review. Additionally, studies that focused on participants who took any long-term medications (longer than two weeks) were not be included in the analysis due the potential impact of medications on blood glucose levels.

Article and Year	Participants, Sample, and Study Design	Variables and Purpose of Study	Intervention Details, Data Analysis (DA), and Measures	Results (or Key Findings)	Strengths and Weaknesses	Nursing Implications
Amer, K. (2008). Children's views of their adaptation to type 1 diabetes mellitus. <i>Pediatric Nursing</i> , 34(4), 281-288.	31 adolescents with T1DM Ages 12-15 years 12 female Questionnaire/Survey Study	IV: Age, gender, socioeconomic status (SES), duration of disease, and DV: Child adaptation, self-perception, and attitude towards disease Purpose: To explore child adaptation to type 1 diabetes through the child's perspective of his or her attitude toward the illness and perception of self.	No intervention, DA: Multiple linear regression. Child Attitude Toward Illness Scale (CATIS). The CATIS is a short self-report instrument that measures children's feelings about having a chronic illness	Increased HbA1C is associated with longer disease duration ($r = 0.4275, p < 0.05$) Attitude towards disease also improves with disease duration ($r = 0.3663, p < 0.05$). Most children reported positive self-worth (84%) Positive attitudes towards illness preserves adaptation and provides resistance to poor adaptation. ($r = 0.2313$) Negative attitudes towards the disease have a negative impact on self-worth ($r = -0.1752$)	Strengths: Clear definition of goals. Validated the efficacy of separate constructs highlighting that they yield different results. Weaknesses: Incomes of families are not representative of all families with T1DM. Small number of subjects. Self-report only, did not include the parents. Did not address the variables which may impact a child's ability to cope (e.g. social factors)	Assess children for risks for coping or adaptation. Provide psychosocial resources when risks to coping are identified. Use tools of self-report to assess a child's self-worth and perceptions about disease. High-risk appraisal of children with T1DM can assist with speedy care and attention to these children and families. Recognize that the HbA1C is only one factor indicating adherence; there are a multitude of factors (such as self-worth) that may influence adherence and attitude toward their disease.

<p>Sato, A., Berlin, K., Hains, A., Davies, W., Smothers, M., Clifford, L., & Alemzadeh, R. (2008). Teacher support of adherence for adolescents with type 1 diabetes: Preferred teacher support behaviors and youths' perceptions of support. <i>Diabetes Educator</i>, 34, 866-873.</p>	<p>102 adolescents with T1DM Ages 10-18 years 60% female 81 Euro Am. 6 African Am. 4 Hispanic Am. 2 Asian Am. 2 Indian Am. 5 Multiracial</p> <p>Cross-Sectional Survey/ Outcomes Study</p>	<p>IV: Teen age and gender, teacher support style DV: Teen preference and perception of teacher support Purpose: To examine the preferences of adolescents with type 1 diabetes regarding the role of teacher support and perceptions associated with the most supportive and least supportive teachers, as well as to examine the effects of child age and gender on these relationships.</p>	<p>No Intervention</p> <p>DA: Independent t-tests</p> <p>Measures: Teacher support was examined by the Diabetes Teacher Support Questionnaire (DTSQ). The DTSQ was adapted from the Diabetes Social Support Questionnaire (DSSQ), 15 a 28-item self-report measure friends' support for diabetes care.</p> <p>Perceived frequency of support behaviors: Most supportive teacher (SD = 7.37) Least supportive teacher (SD = 16.52) Feelings about support behaviors: Most supportive teacher (SD = 8.37) Least supportive teacher (SD = 8.07)</p>	<p>Teachers who were more engaging were perceived as more supportive ($p < 0.05$; $r = 0.57$) and those who respected privacy were perceived as least supportive ($p < 0.05$; $r = 0.25$)</p> <p>Girls prefer actively involved teachers ($p < 0.05$, $r = 0.18$)</p> <p>Girls perceive support to a greater extent than boys ($r = -0.45$; $p < 0.01$)</p> <p>Perceptions of frequency as "supportive" decreases with increasing age ($r = 0.02$, $p < 0.05$)</p>	<p>Strengths: Well defined variables Strong focus on gender and age</p> <p>Weaknesses: Self-report from teen perspective only; need for teacher perspective All data collected from same clinic; affects generalizability in other settings Exclusion of analyzing factors that may affect preference (e.g. income, culture, parenting styles, etc.)</p>	<p>Assess the teen for preferences of support, whether it be greater or lower frequency of support behaviors.</p> <p>Consult with school faculty to facilitate a "goodness of fit" between the teen and the instructor (if possible)</p> <p>Educate the staff and teachers on the differences between T1DM and T2DM and how to recognize signs and symptoms of hyperglycemia and hypoglycemia.</p>
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<p>Fernandes, R., Wales, S., Crisp, J., & Kyngas, H. (2011). Modification and testing of the chronic disease compliance instrument to measure treatment compliance in adolescents with diabetes. <i>Journal of Clinical Nursing</i>, 20 1273-1281.</p>	<p>133 adolescents with T1DM Ages 12-17 Self Report Questionnaire</p>	<p>IV: Experiences with compliance behavior DV: To examine the factor structure and internal consistency of the Chronic Disease Compliance Instrument—Diabetes in an Australian sample of adolescents with diabetes, to modify the instrument and re-examine factor structure and internal consistency of subsequent scales and to examine the relationship between compliance behavior and theoretically relevant explanatory factors.</p>	<p>43-item inventory questionnaire Addresses: - support from doctors/nurses/parents/friends - experience of results - fear of hypoglycemia - energy and will power - motivation - compliance - sense of normalcy Results demonstrated that the factors that significantly correlated with compliance accounted for 30.5% of variance in self-reported compliance behavior (based on the Adjusted R-square value) and that this model of factors was statistically significant</p>	<p>Eight factors assessed (out of eleven) were associated with compliance behavior: - sense of normalcy - support from doctors - support from nurses - support from family - experience of results - energy - motivation - sense of responsibility ($r = 0.31$) ($p < 0.001$) - Factors not associated with compliance: - future health fears - fear of hypoglycemia - support from friends ($r = 0.58$) ($p < 0.001$)</p>	<p>Strengths: - No reported conflicts of interest - Heavy focus on internal consistency and reliability of survey tools Weaknesses: - Original tool was developed in Finnish, then translated into English, previous results may not be generalizable to American teens - Failure to address additional factors which may influence compliance behavior in future studies - Neglected to address rationale for missing data in early questionnaire results - Low Cronbach alpha score (0.58-0.81) for CCDI tool</p>	<p>Findings provide a list of relevant factors for explaining compliance behavior, which may be employed to guide the development of initiatives to increase the level of compliance to treatment among adolescents with diabetes. Assess patient needs for social support relating to the 11 survey factors Assess need for greater metabolic control (HbA1c) Assess for negative disease perception</p>
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<p>Mulvaney, S., Hood, K., Schlundt, D., Osborn, C., Johnson, K., Rothman, R., & Wallston, K. (2011). Development and initial validation of the barriers to diabetes adherence measure for adolescents. <i>Diabetes Research & Clinical Practice</i>, 94, 77-83.</p>	<p>123 adolescents with T1DM Ages 12-17 Survey/ Outcomes study</p>	<p>IV: experiences with stress, burnout, time, pressure, planning, social support, parental autonomy, and stigma</p> <p>DV: adherence to diabetic regimen (HbA1C)</p> <p>Purpose: To develop a measure of psychosocial barriers to adherence in adolescents with type 1 diabetes (T1D) and examine relationships to patient characteristics, adherence, and hemoglobin A1C (A1C).</p>	<p>21-item, five-component survey.</p> <p>Measures: The components were stress and burnout, time pressure and planning, social support, parental autonomy support, and stigma. The BDA total and subscales were internally consistent. The BDA total and some components were associated with adherence and A1C. The BDA was the only predictor of A1C compared to demographic, clinical, and adherence variables.</p>	<p>Subjects with higher A1C (>8.5) showed a higher level of barriers and a differential profile of barriers</p> <p>Females ($p < 0.05$; $r = 0.82$) indicate greater barriers to adherence associated with social support and stigma and, seek social support and networking more than boys</p> <p>($p < 0.05$; $r = 0.43$)</p> <p>Barrier score shared positive relationship with A1C ($p < .005$; $r = 1.32$)</p> <p>Stress and burnout represented highest barrier prevalence (36%)</p>	<p>Strengths: BDA items reviewed by target population prior to administration Use of tools with high reliability in similar studies and power analysis</p> <p>Weaknesses: Lacked demographic details such as household size, one parent vs. two parent household Need for larger sample size Need for longitudinal analysis Need to assess for outside factors that influence disease perception (e.g. embarrassment, social challenges, etc.) Prominent Caucasian sample</p>	<p>Specifically, the use of barriers profiles may provide a more efficient and evidence-based means to guide adolescents toward relevant educational experiences and interventions.</p> <p>The subscale scores may have greatest utility when tailoring interventions for individuals or targeting groups of individuals clinically</p>
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Malik, J., & Koot, H. (2011). Assessing diabetes support in adolescents: Factor structure of the Modified Diabetes Social Support Questionnaire (M-DSSQ-Family). <i>Pediatric Diabetes</i> , 12, 258-265.	437 adolescents with T1DM Ages 11- 19 54.5% F 45.5% M Insulin and pump therapy Survey/ outcomes research	IV: Individual experiences of teens regarding social support from family DV: Variances in M-DSSQ scores Purpose: To determine the underlying factor structure of diabetes specific support using a modified diabetes family social support questionnaire	Exploratory factor analyses in the sample suggested 40% variance in five factors including 45 items Items included: Guidance and Supervision Self-Care Emotional Support Nourishment and Critical Situations	Multi-group comparison of the final factor structure revealed that the structure of the final 40-item M-DSSQ-Family holds for both boys and girls and for younger as well as older adolescents, whereas the reliability analysis across these groups suggested the wide applicability of the scale across all adolescents 40 item questionnaire compared to a 70 items questionnaire (more time and cost effective to administer)	Strengths: Tested M-DSSQ on first half of subjects, then confirm with second half Power analysis with both exploratory and confirmatory factor analyses Weaknesses: Larger samples are required for validation of the questionnaire across various age groups of adolescents Needs to address sensitivity to change in longitudinal studies	The M-DSSQ Family taps relevant domains of diabetes social support and that may be used in research and counseling and revealed aspects of diabetes social support perceived as supportive by adolescents that differ from theoretical deduction classifications of diabetes specific support.
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Harris, M. A., Greco, P., Wysocki, T., & White, N. H. (2001). Family therapy with adolescents with diabetes: A litmus test for clinically meaningful change. <i>Families, Systems, & Health</i> , 19(2), 159-168. doi:10.1037/h0089445	119 adolescents with T1DM Mean age of participants: 14.5 Female 56% Single-parent 41% DM duration: 5.4 Intervention/Outcomes Study	IV: Individual responses to therapy sessions. DV: Changes in diabetes-related conflict Purpose: To demonstrate the efficacy of family therapy in producing clinically significant change in diabetes-related conflict for families of adolescents with diabetes.	10 sessions of Behavioral Family Systems Therapy (BFST) or 10 sessions of an education support group (EDSP) or no specific psychosocial treatment (CONT). DA: Meta-analytic for BFST Z-score to determine and/or estimate clinical significance.	BFST can produce clinically significant change in diabetes related conflict, especially in mothers. Adolescents Pretreatment 6.1 Post-treatment 4.5 ($p < 0.005$) Mothers Pretreatment 9.5 Post-treatment 5.1 ($p < 0.005$) Fathers Pretreatment 9.9 Post-treatment 6.8 ($p < 0.005$)	Strengths: Well-defined goals. Inclusion of fathers as caregivers. Included both adolescent and parental report. Weaknesses: Cross-sectional; needs longitudinal to evaluate efficacy and significance. Only one outcome measure was used for evaluation.	Interventions that target diabetes related conflict or metabolic control will be beneficial for T1DM teens as well as interventions targeted at the family as a system. Assess patient and families for diabetes related conflict. Assess for barriers to communication within families.
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<p>Naar-King, S., Podolski, C., Ellis, D. A., Frey, M. A., & Templin, T. (2006). Social ecological model of illness management in high-risk youths with type 1 diabetes. <i>Journal of Consulting And Clinical Psychology</i>, 74(4), 785-789. doi:10.1037/0022-006X.74.4.785</p>	<p>High risk, adolescents with T1DM who live in urban areas</p> <p>Ages 12-17</p> <p>96 participants</p> <p>46% male</p> <p>54% female</p> <p>86% biological parents</p> <p>4% adoptive</p> <p>1% foster</p> <p>1% stepparents</p> <p>2% other persons</p> <p>53% two-parent households</p> <p>43% one-parent households</p> <p>49% reported income less than \$25,000</p> <p>Questionnaire/Survey Study</p>	<p>IV: Individual environment of each T1DM teen</p> <p>DV: Effects on metabolic control</p> <p>Purpose: To test a social ecological model of illness management that simultaneously assessed the contributions of multiple systems in a sample of urban, primarily minority youths with Type 1 diabetes in poor metabolic control.</p>	<p>No intervention.</p> <p>DA: Bivariate and multivariate analysis</p> <p>Ordinary least squares regression with backwards elimination</p> <p>Measures: The adolescent and the parent completed the Diabetes Self-Management Scale (DMS). The DMS includes the 18 items that focus on illness-management behaviors, including dietary compliance, insulin injections, blood glucose monitoring, and exercise.</p>	<p>Adherence to diabetic care deteriorates in adolescence</p> <p>Externalizing symptoms contribute more to adherence than internalizing symptoms.</p> <p>Four predictors: Externalizing symptoms ($p < 0.01$)</p> <p>Family relations ($p < 0.02$)</p> <p>Provider relations ($p < 0.02$)</p> <p>Age ($p < 0.03$).</p>	<p>Strengths: Clearly defined demographics</p> <p>Clearly defined goals</p> <p>Inclusion of family size, income, caregiver type, and mode of diabetes management (pump vs. injections)</p> <p>Weaknesses: Based off self-report only</p> <p>Only focuses on urban populations</p> <p>Does not include factors such as teachers, peers, and other social influences on management</p> <p>Cross-sectional study, needs longitudinal study to evaluate long term effects</p>	<p>Nurses should be aware of the fact that teens are at greater risk as they become older and more independent from their caregivers</p> <p>Teens should be considered "high-risk" groups when it comes to poor diabetes management</p> <p>Interventions aimed at social cooperation and support are necessary to facilitate optimum adherence in T1DM teens.</p> <p>Poor satisfaction with healthcare providers may be a significant factor in poor adherence.</p>
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<p>Helgeson, V. S., Lopez, L. C., & Kamarck, T. (2009). Peer relationships and diabetes: Retrospective and ecological momentary assessment approaches. <i>Health Psychology, 28</i>(3), 273-282. doi:10.1037/a0013784</p>	<p>76 adolescents with T1DM Ages 13-16 50% male 50% female Survey/ Questionnaire Study</p>	<p>IV: Individual gender and quality of peer relationships DV: Self-care behavior, blood glucose control, and psychological well-being Purpose: To examine the association of positive and negative aspects of friendship to psychological well-being, self-care behavior, and blood glucose control and to determine whether these relations were moderated by gender.</p>	<p>No intervention. DA: Regression analysis. Multilevel modeling with HLM 6 software. Aggregate analysis for between-group analysis Measures: Depressive symptoms were measured using the 20-item Center for Epidemiological Studies Depression-Scale (CES-D). Adolescents are asked to indicate how often they experienced each symptom in the past two weeks.</p>	<p>Family support is associated with disease adaptation ($p < 0.05$; $r = 0.04$) Adolescents perceive greater support from friends as they age Parents are an important source of diabetes care, friends are more a source of emotional support. Conflict with friends produce more depressive symptoms, worse self-care, and poor metabolic control. ($r = 0.29$, $p < 0.05$) Conflict has a greater affect on girls ($p < 0.05$; $r = 0.78$), than boys relationships ($p < 0.05$; $r = 0.43$) Girls may tend to ruminate over upsetting interactions more than boys Negative interactions seem to have a longer lasting effect than positive interactions.</p>	<p>Strengths: Clearly defined goals Acknowledgement of effects of time on social experiences Tested both positive and negatives aspects of peer relationships Examined gender as a moderator of diabetes self-care and psychological well-being Weaknesses: Relationships were assessed with different measures between groups, cannot make casual inferences from differing constructs Large number of analyses were taken from a smaller sample (76). Cross-sectional, need for longitudinal study to evaluate relationships further.</p>	<p>Nurses should be aware of the fact that girls are more sensitive to peer interactions than boys. Communicating to the caregivers that female diabetics respond more to social acceptance may focus their family communication on building strong friendships. Assess girls with poor social support as higher risk group for poor metabolic control and poor psychological well being Evaluate teens for effective coping skills and the presence of healthy relationships at school and at home.</p>
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<p>Bearman, K., & La Greca, A. (2002). Assessing friend support of adolescents' diabetes care: the diabetes social support questionnaire-friends version. <i>Journal of Pediatric Psychology</i>, 27(5), 417-428.</p>	<p>74 adolescents with T1DM Ages 11-18 60% males Two parent families (78.4%) Single-parent (12.2%) Other living arrangements (9.3%) Survey/ Outcomes Study</p>	<p>IV: Age, gender, and friend support DV: Diabetes treatment adherence Purpose: To develop and evaluate the Diabetes Social Support Questionnaire (DSSQ).</p>	<p>No intervention. DA: Paired t-tests Cronbach's alpha Hierarchical multiple regression</p>	<p>Adolescent age does not impact the frequency or supportiveness of friends' diabetes-specific support. ($p < 0.004$; $r = 0.06$) Girls perceive more support than boys. Girls: ($r = 0.78$; $p < 0.05$) Boys: ($r = 0.45$; $p < 0.05$) Teens' friends may facilitate adjustment to chronic disease and ability to cope with difficult medical treatment. ($p < 0.05$; $r = 0.67$) Family members provide more support for daily management tasks (e.g. insulin, meals, etc.) ($r = 0.75$; $p < 0.04$) Friends provide more support for exercise and "feeling good." ($r = 0.69$; $p < 0.05$) Teen's age is generally unrelated to frequency of friends' diabetes-related support. ($r = 0.11$; $p < 0.04$)</p>	<p>Strengths: Clearly defined goals. Addressed impact of family type and size. Addressed impact of gender and age. Weaknesses: Only relied on teen report; did not include input from friends. Cross-sectional study; need for longitudinal study to evaluate long term effects of friend support. Small sample size. Population was mostly Caucasian; not generalizable to general populations.</p>	<p>Assess T1DM teens for presence of social support systems at school and at home. Encourage communication about disease stressors among peers to facilitate a supportive network. Identify female teens at higher risk for poor diabetes management when peers is non-supportive or lacking. Encourage family to focus supportive interventions at management behaviors (insulin, meal planning, etc.) and peers to focus on emotional support and exercise behaviors.</p>
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Greco, P., Pendley, J., McDonell, K., & Reeves, G. (2001). A peer group intervention for adolescents with type 1 diabetes and their best friends. <i>Journal of Pediatric Psychology</i> , 26(8), 485-490.	21 adolescents with T1DM and their best friend Ages 10-18 10 females 71% two-parent homes Interventional Study	IV: Differences in peer support and reaction to group intervention. DV: Peer support, self-perception, and peer knowledge of disease. To devise and implement a structured intervention for integrating peers into diabetes care in a healthy and adaptive manner.	Four 2-hour education and support group sessions led by licensed psychologists. No disclosed use of data analysis. Measures: The Diabetes Social Support Inventory (DSSI) was used to measure social support. The DSSI is an interview consisting of 10 open-ended questions pertaining to diabetes support provided by family and peers.	Following the intervention, adolescents and their friends demonstrated higher levels of knowledge about diabetes and support, as well as a higher ratio of peer to family support, and friends demonstrated improved self-perception. Pre-intervention score DSSI: 73.62 Post-intervention score DDSI: 123.43 Parents reported decreased diabetes-related conflict. Pre-intervention DRC: 27.81 Post-intervention DRC: 25.47	Strengths: Clear definition of goals. Addressed the presence of any psychological diagnoses as an exclusion factor for the study. Weaknesses: Small study sample Short follow up period Cross-sectional Lack of control group Low participation rate (62%)	Assess teens with T1DM for adequate support systems Educate friends and family on the importance of peer support in the treatment and management of T1DM. Encourage group interventions among T1DM teens and the involvement of best friends. Assess families for presence of conflict and risk for poor adherence.
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<p>Pereira, M., Berg-Cross, L., Almeida, P., & Machado, J. (2008). Impact of family environment and support on adherence, metabolic control, and quality of life in adolescents with diabetes. <i>International Journal of Behavioral Medicine</i>, 15(3), 187-193.</p>	<p>157 adolescents with T1DM Ages 10-18 Questionnaire/Survey Study</p>	<p>IV: Age, gender, duration of disease, individual family environment and social class. DV: Adherence to treatment, quality of life, and metabolic control. Purpose: To determine the impact of family factors on diabetes, particularly the influence of family support and family environment on adherence to treatment, quality of life, and metabolic control.</p>	<p>No intervention. DA: Descriptive statistics Partial correlations series Multiple regression analysis. Measures: The Diabetes Family Behavior Scale measured affective family support, control and direct support, indirect support, and no support. The Family Environment Scale measured conflict, cohesion, and family organization, whereas the Diabetes Quality of Life was used to measure quality of life in adolescents.</p>	<p>Higher family social support predicts higher adherence and higher quality of life. ($r = 0.67$; $p < 0.05$) For females, increased family support also predicted an increase in adherence. ($r = 0.78$; $p < 0.001$) Social support from a partner results in better metabolic control for males, but not females. Males: ($p < 0.05$; $r = 0.76$) Females: ($p < 0.05$; $r = 0.18$) Family support predicted quality of life and adherence better in lower class patients. ($p < 0.004$; $r = 0.87$) Family organization predicted quality of life better in middle class patients. ($p < 0.004$; $r = 0.79$) Family conflict predicts metabolic control better in upper class families. ($p < 0.004$; $r = 0.9$)</p>	<p>Strengths: Clearly defined goals. Assessed family class as a factor in diabetic adherence. Weaknesses: Used self-report as the only measure. Did not include report from the parents. Cross-sectional; need for longitudinal study to evaluate effect of family environment over time. Adherence was high in this population; not generalizable to teens with low adherence. Assessment measures were tested within the population of study.</p>	<p>Assess families for impaired communication and risk for conflict Assess patient for inadequate metabolic control. Encourage parent-teen communication about diabetes-related stressors. Educate parents on their role in diabetic management and emotional support. Tailor psychosocial interventions towards individual needs. Identify females as higher risk for poor social support and therefore poor diabetic adherence.</p>
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<p>Hains, A., Berlin, K., Davies, W., Smothers, M., Sato, A., & Alemzadeh, R. (2007). Attributions of adolescents with type 1 diabetes related to performing diabetes care around friends and peers: the moderating role of friend support. <i>Journal of Pediatric Psychology</i>, 32(5), 561-570.</p>	<p>102 adolescents with T1DM Ages 10-18 60% female Questionnaire/Survey Study</p>	<p>IV: Individual experiences with negative peer reactions. DV: Diabetes management, adherence, friend support, stress, and metabolic control. Purpose: To examine the relationships among negative attributions of friend and peer reactions to diabetes management in social situations, anticipated adherence difficulties, friend support, diabetes stress, and metabolic control.</p>	<p>No intervention. DA: Maximum-likelihood estimation method in LISREL 8.54 Measures: Friend support was examined by the Diabetes Social Support Questionnaire (DSSQ). The DSSQ is a 28-item self-report measure of friends' support for diabetes care. Metabolic control of the sample was measured by the percentage of hemoglobin A1c (HbA1c), and was obtained from the clinic visit during which the adolescents were recruited.</p>	<p>Negative reactions from peers relating to diabetic management results in increased difficulty adhering to health regimens. ($r = 0.56; p < 0.01$) As friend support increased, so did diabetes stress and poor metabolic control. ($r = 0.68; p < 0.01$) Teens with higher diabetes stress may not effectively use coping mechanisms, or may view peer support adversely. ($r = -0.25; p < 0.04$)</p>	<p>Strengths: Clearly defined goals. Use of scoring tools with high Cronbach alpha (>0.85) Weaknesses: Teen report may not fully represent behavior in real social situations. Only relied on teen self-report; peer input would be useful. Predominately Caucasian sample, poor generalizability. Small sample size. Cross-sectional.</p>	<p>Interventions should focus on correcting any psychosocial barriers related to adherence. Assess patient for impaired social support from peers. Encourage open discussion between parents and patient regarding the importance of social support in diabetes management. Assess patient fears regarding diabetes management in social situations.</p>
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<p>Austin, S., Senécal, C., Guay, F., & Nouwen, A. (2011). Effects of gender, age, and diabetes duration on dietary self-care in adolescents with type 1 diabetes: a self-determination theory perspective. <i>Journal of Health Psychology, 16</i>(6), 917-928.</p>	<p>289 adolescents with T1DM Ages 11-17 46% female Questionnaire/Survey Study</p>	<p>IV: Gender, age, and diabetes duration of teen. DV: Dietary self-care behaviors. Purpose: To explain the mechanisms by which non-modifiable factors influence dietary self-care in adolescents with type 1 diabetes.</p>	<p>No intervention. DA: SEM model Comparative fit index Structural equation modeling Measures: Perception of autonomous motivation was assessed using by the Dietary Self-care Motivation Scale for Adolescents with Diabetes (DSMS-AD) This scale consists of 12 statements that answered the question: "Why do you follow your dietary plan?"</p>	<p>Girls with longer diabetes duration (not age) are more likely to neglect their diet ($p < 0.04$; $r = 0.53$) have more complications ($p < 0.05$; $r = 0.43$) and worse metabolic control ($p < 0.04$; $r = -0.36$) than boys. Girls with T1DM are twice as likely to present with eating disorders. Girls with longer DM duration perceive less support than boys. ($r = 0.54$; $p < 0.08$) Expectations for dietary adherence may be higher for girls. Social support from multiple sources is crucial for effective DM management. Greater feelings of autonomous motivation leads to better management. ($r = 0.61$; $p < 0.04$)</p>	<p>Strengths: Clearly defined goals. Use of high Cronback alpha tools (>0.85) Weaknesses: All data from self-report only. Limited factors contributing to self-care addressed. Dietary behaviors are dynamic and may change with disease duration and age. Cross-sectional study; longitudinal study needed to evaluate long-term changes in dietary self-care as age and disease duration progress.</p>	<p>Psychosocial interventions should focus on promoting the perception of self-autonomy and choice in the teens' management of their diabetes. Identify girls as a higher risk for poor dietary self-care as disease duration increases. Apply the same expectations for self-care for girls as with boys. Assess for presence of eating disorders in female T1DM teens. Assess for multiple sources of social support. Encourage parent-teen discussion on how to better promote autonomy in diabetes self-care.</p>
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Jaser, S. S., & White, L. E. (2011). Coping and resilience in adolescents with type 1 diabetes. <i>Child: Care, Health & Development</i> , 37, 335-342.	30 adolescents with T1DM and their mothers Ages 10-16 52% F 48% M Survey/ Outcomes study	IV: Level of resilience DV: Use of primary, secondary, and disengagement coping skills Purpose: Using a developmentally sensitive coping measure to explore coping strategies impact resilience (quality of life, competence, and metabolic control).	No intervention. No explicit use of data analysis stated in article. Measures: The Responses to Stress Questionnaire assessed coping strategies used by adolescents in response to diabetes-related stressors, the Child Behavior Checklist was completed by mothers to assess their children's competence over the past 6 months, and the Youth Self Report was completed by the adolescents and assessed their perception of their own competence. Quality of life was measured using the Pediatric Quality of Life questionnaire and glycosylated haemoglobin was obtained from adolescents' medical record.	Greater use of primary control coping strategies (e.g. problem solving, emotional expression) was associated with higher competence scores ($p < 0.04$; $r = 0.43$), better quality of life ($p < 0.04$; $r = 0.36$) and better metabolic control ($p < 0.04$; $r = 0.45$). Secondary control coping strategies (e.g. acceptance, distraction) were related to higher social competence ($p < 0.05$; $r = 0.34$), better quality of life ($p < 0.05$; $r = 0.54$) and better metabolic control ($p < 0.03$; $r = 0.48$). Finally, the use of disengagement coping strategies (e.g. withdrawal or denial) was linked with lower competence ($p < 0.05$; $r = -0.35$) and poorer metabolic control ($p < 0.03$; $r = -0.57$).	Strengths: Provides clinicians with specific data on effective coping mechanisms Uses developmentally sensitive survey tools (e.g. Pediatric Quality of Life Questionnaire) Weaknesses: Fathers not included Small sample size Casual factors not measured Longitudinal study needed Limited treatment practices of clinic (pump vs. injection ratios)	Talking with adolescents about ways they may incorporate adaptive coping strategies into their lives, using relevant examples, may increase the likelihood that they will use them
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Céspedes-Knadle, Y. M., & Muñoz, C. E. (2011). Development of a group intervention for teens with type 1 diabetes. <i>Journal for Specialists in Group Work</i> , 36, 278-295.	30 adolescents with T1DM and at least one caregiver. Ages 11-17. Survey/outcomes study	IV: responses to group psychosocial group intervention sessions DV: (teens: positive attitudes, increased metabolic control; caregivers: reduced stress) Purpose: To describe the development and implementation of a group intervention for adolescents with T1DM and a parallel caregiver support group. Aimed to improve psychosocial functioning and medical adherence in T1DM teens and to reduce stress in caregivers.	Interdisciplinary teams including, nursing, psychology, medicine, social work and nutrition conducted educational sessions of T1DM teens. Session meet once weekly for 120 minutes, total of 10 sessions. Unstructured meal-time: 30 minutes. Separate teen and caregiver activities: 90 minutes. Sessions address: cultural needs, motivation, goals, self-esteem, school issues, stress management, communication, exercise, diabetes knowledge, high risk behaviors, and nutrition. Measures: Researchers measured results using self-report questionnaires collected after the treatment sessions.	Adolescents showed improved competency in peer group settings. Reported reduced stress with shared dialogue with fellow T1DM caregivers. Reported more confidence in management with teens engaged in workshops compared to reluctant teens. Much data yet to be gathered on intervention evaluation on a larger sample size. Following the group sessions, adolescents showed increased diabetes knowledge ($p < 0.05$), personal motivation ($p < 0.004$), social support ($p < 0.03$), and improved metabolic outcomes ($p < 0.05$). In addition, preliminary review of questionnaires showed reduced stress in caregivers and more positive attitudes among teens ($r = -0.47$; $p < 0.005$).	Strengths: Provides structural education to teens in a developmentally appropriate manner Allows for involvement of caregivers Provides for peer discussion and supportive networking Weaknesses: No longitudinal information gathered to monitor A1C Inadequate sample size No data on depression, caregiver stress, attitude toward diabetes or motivation for behavioral change Number and demographics of participants left unspecified Confidence and validity of evaluation tools unspecified	Group psychosocial interventions should be encouraged for T1DM teens and their caregivers Encouraging networking for caregivers and teens can bolster positive attitudes in teens and reduce caregiver stress Assess caregivers for unhealthy levels of stress and inquire about the teen support system at school and at home Assess current attitudes and metabolic control of teens that require intervention
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Carroll, A., Dimaggio, L., Stein, S., & Marrero, D. (2011). Contracting and monitoring relationships for adolescents with type 1 diabetes: A pilot study. <i>Diabetes Technology & Therapeutics</i> , 13, 543-549.	10 adolescents with T1DM living with at least one parent. Must speak english. Ages 14-18 Semistructured interviews.	IV: Quality of life, hemoglobin A1C DV: Use of behavioral contract in conjunction to cell-phone monitoring system Purpose: To develop a behavioral contract between parents and T1DM teens with negotiable points of conflict and assess effectiveness in a pilot cellphone monitoring device.	No intervention. Scripts of the semi-structured interviews were analyzed and categorized into - usefulness of contract - family dynamics - quality of life - competence in disease management - glycemic control Measures: The Cornell Parent Behavior Scale was used to measure consequences of parent behavior and the Helping for Health Inventory was used to measure levels of mis-carried helping. Adolescent quality of life was measured using the Varney's Pediatric Quality of Life Scale and metabolic control was measured using the HbA1c from the clinic charts.	Behavioral contracts may be an important adjunct to reduce nagging and facilitate behavior changes. ($p < 0.004$) Glucose testing involved the most nagging. ($p < 0.05$; $r = 0.41$) Teens wish contact with a clinical team could be more regular. ($p < 0.03$)	Strengths: Provides preliminary data to support effectiveness of technology in disease management Weaknesses: Small pilot study Conducted over short time frame Technology not integrated into full clinical setting	Nurses who care for teens with diabetes must be aware of the significance of behavioral contracts and their effectiveness within certain populations. Technologies such as the cellphone pilot should be discussed with parent-adolescent pairs to give a unique approach to behavioral conflict.
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<p>Dashiff, C., Riley, B. H., Abdullatif, H., & Moreland, E. (2011). Parents' experiences supporting self-management of middle Adolescents with type 1 diabetes mellitus. <i>Pediatric Nursing</i>, 37, 304-310.</p>	<p>40 Parents of adolescents with T1DM Ages 16-18 Families: 10 biological two parent 7 stepparent 1 grandparent/guardian 1 mother and partner 4 single parent Semi-structured interviews</p>	<p>IV: Perceptions and feelings DV: Family size and type Purpose: Describe feelings and perceptions of parents to T1DM teens ages 16-18 as the adolescents prepare to transition into adulthood. Focus on how actions facilitated or impeded self-management.</p>	<p>No intervention. DA: No explicit description of data analysis Measures: Themes and codes were systematically organized by producing a grid of codes within the themes and displaying all verbatim quotes from families within each code. Responses of mothers and fathers were separately coded to determine whether mothers and fathers had similar or different perspectives.</p>	<p>Parents expressed anxiety over the teen's disease management while away from home. Actions which supported self-management included: reminding, granting freedom, stressing complications, fostering responsibility, getting tough, and assuming responsibility for child. ($p < 0.003$; $r = 0.57$) Actions which inhibited self-management included: scolding, judging, checking, nagging, and getting emotional. ($p < 0.004$; $r = -0.45$)</p>	<p>Strengths: Direct quotes from participants strengthen the validity and generalizability of the data Fills gap of data regarding parental perceptions and anxieties of late teen period (16-18). Weaknesses: Inconsistencies with qualitative description between interviews No focus given to differences in family size and type (siblings, ethnicity, single-parent vs. two parent households) No differentiation between pump management and multiple injection teens</p>	<p>Clinical interventions are needed that help parents to manage this anxiety and provide parents with needed reassurance their adolescent can self-manage when outside the purview of parents. Assessing the experience of parents is useful to identify these parental concerns.</p>
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<p>Paterson, B., & Brewer, J. (2009). Needs for social support among parents of adolescents with diabetes. <i>Journal of Nursing & Healthcare of Chronic Illnesses</i>, 1, 177-185.</p>	<p>9 parents of adolescents with T1DM</p> <p>Inner-city</p> <p>3M</p> <p>6F</p> <p>Ages 17-21</p> <p>Interpretive/descriptive naturalistic inquiry</p>	<p>IV: Individual teen experiences regarding social support</p> <p>DV: Report of parent and teen perspectives and perceptions of support</p> <p>Purpose:</p> <p>To investigate the perspectives of parents of adolescents with type 1 diabetes about their needs for social support during their child's adolescence related to diabetes management</p>	<p>No intervention.</p> <p>DA:</p> <p>7 interviews conducted at participant choice of location; 2 conducted over telephone</p> <p>Interview addressed dimensions of social support needs</p> <p>Measures:</p> <p>Data analysis was used to identify concepts, themes, or theoretical categories in the data that can inform future research in the area</p>	<p>Parents of adolescents with diabetes experienced significant needs for social support, specifically in relation to the adolescent assuming primary responsibility for diabetes management.</p> <p>Their preferred sources of support were e-mail or online, provided by both health care practitioners and other parents of adolescents with diabetes.</p>	<p>Strengths:</p> <p>Clarity of analytic framework and discussion of data results</p> <p>Weaknesses:</p> <p>No mention of treatment modality (pump vs. injection)</p> <p>No mention of race, household type, size, or income</p> <p>No uniformity of interview environment</p> <p>Only parents who experienced stress volunteered for the study</p> <p>No discussion of generalizability of findings with regard to sample utilized</p>	<p>Emphasizes the need for diabetes practitioners to engage parents and adolescents in a discussion of parental involvement</p> <p>Not all parents know how to make the transition from primary decision maker to onlooker, and some experience considerable ambiguity about this being a goal in their parenting</p> <p>Comprehensive online social support programs feature an assortment of options, including online encyclopedias, decision-support systems, question and answer capabilities, behavior modification aids, as well as communication modules.</p>
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<p>Morrison, S., Dashiff, C., Abdullatif, H., & Moreland, E. (2012). Parental separation anxiety and diabetes self-management of older adolescents: A pilot study. <i>Pediatric Nursing</i>, 38, 88-95.</p>	<p>23 families of adolescents with T1DM (at least one parent/guardian to the teen)</p> <p>Must speak english</p> <p>Ages 16-18</p> <p>T1DM for at least 1 year</p> <p>Enrolled in 12th grade</p> <p>Without any other chronic medical illness</p> <p>Survey/outcomes research</p>	<p>IV: Separation anxiety levels among fathers and mothers of T1DM teens</p> <p>DV: self management and glycemic control of T1DM teens</p> <p>Purpose:</p> <p>To investigate whether there were relationships among mothers' and fathers' separation anxiety, adolescent self management, and glycemic control in high school seniors 16 to 18 years of age</p>	<p>Partial correlations revealed that the relationship between paternal separation anxiety and HbA1C remained significant even when the number of years since the diagnosis of diabetes was controlled.</p> <p>Measures:</p> <p>Both the Parental Separation Anxiety Scale (PSAS) and the Anxiety about Adolescent Distancing Scale (AAD) were used to measure parental anxiety. The Diabetes Self-Management Profile (DSMP) assess self-management skills necessary for glycemic control for patients with T1DM, and metabolic control was taken from the adolescents' medical chart.</p>	<p>Adolescents with longer durations of T1D were more likely to have worse glycemic control.</p> <p>($r = -0.56; p < 0.05$)</p> <p>A relationship of SES with parental separation anxiety was not found.</p> <p>($r = 0.12; p < 0.004$)</p> <p>Duration of T1D was not related to adolescents' reports of diabetes self-management.</p> <p>($r = -0.08; p < 0.05$)</p> <p>Adolescent diabetes tasks self-management is not directly influenced by parental separation anxiety.</p> <p>($r = 0.09; p < 0.003$)</p> <p>Fathers with higher separation anxiety had adolescents with better glycemic control.</p> <p>($r = 0.78; p < 0.005$)</p> <p>Better self-management was associated with glycemic control.</p> <p>($r = 0.56; p < 0.005$)</p>	<p>Strengths:</p> <p>Clear correlation of variables</p> <p>Clear definition of family setting (household size, caregivers, etc.)</p> <p>Weaknesses:</p> <p>Cross sectional in nature; needs longitudinal studies to evaluate trend of attitudes in self management</p> <p>Larger studies needed to reinforce findings</p> <p>Little focus on exploring the father's role in self-management</p>	<p>Better anticipatory guidance and therapeutic tactics could be employed to confront the challenges of patients with T1D and their families during adolescence.</p> <p>Evaluation of parental roles in adolescent self-management may or may not be predictive of glycemic control in the later adolescent</p> <p>Assess parents for self perceptions of separation anxiety and evaluate impact on family dynamics and glycemic control of the T1DM teen</p>
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<p>Vesco, A., Anderson, B., Laffel, L., Dolan, L., Ingerski, L., & Hood, K. (2010). Responsibility sharing between adolescents with Type 1 diabetes and their caregivers: Importance of adolescent perceptions on diabetes management and control. <i>Journal of Pediatric Psychology</i>, 35, 1168-1177.</p>	<p>261 adolescents with T1DM and their caregivers</p> <p>Ages 13- 18</p> <p>Survey/outcomes research</p>	<p>IV: Individual perceptions of T1DM teens on caregiver responsibility</p> <p>DV: Factor scores on the Diabetes Family Responsibility Questionnaire (DFRQ).</p> <p>Purpose:</p> <p>To analyze associations between factor scores for caregiver responsibility for direct and indirect diabetes management tasks with glycemic control and blood glucose monitoring (BGM) frequency.</p>	<p>No intervention.</p> <p>DA:</p> <p>Confirmatory factor analysis, psychometrics properties and separate multivariate analysis.</p>	<p>Adolescents who perceive greater caregiver responsibility, particularly around direct management tasks, engage in better diabetes management.</p> <p>($r = 0.61$; $p < 0.005$)</p>	<p>Strengths:</p> <p>Utilization of power analysis.</p> <p>Differentiated between injection and pump users.</p> <p>Weaknesses:</p> <p>Need for a longitudinal design.</p> <p>Data relies solely on self-report, no objective data.</p> <p>Need for sampling a greater variety of ethnicities.</p>	<p>Implications of these findings include designing interventions that encourage and sustain caregiver responsibility through adolescence and make explicit the contribution of caregivers.</p> <p>Assess patient for perception of support and responsibility sharing in diabetic management</p> <p>Educate caregivers on how to better increase perception of shared responsibility.</p>
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Konradsdottir, E., & Svavarsdottir, E. (2011). How effective is a short-term educational and support intervention for families of an adolescent with type 1 diabetes? <i>Journal for Specialists in Pediatric Nursing, 16</i> , 295-304.	23 families of adolescents with T1DM Ages 12-17 Intervention/ Outcomes Study	IV: Gender of parent, age of diagnosis, income, education, incidences of hypoglycemia, coping patterns DV: Changes in both familial and parental adaptation/ coping skills Purpose: To study adaptation and coping strategies of parents who had adolescents with diabetes and the effect of a short-term educational and support intervention.	Group education with parents and teens Single support interviews for parents Single support interviews with teens Use of "interventional questions." DA: IV t-test DV t-test Pearson correlation	Positive correlation between income and mother's adaptation. ($r = 0.41$; $p < 0.05$) Parental-diabetes adaptation fluctuates with stress. Greater conflicts in T1DM families ($p < 0.05$; $r = 0.45$) compared to non-DM families ($p < 0.04$; $r = 0.21$). Mothers find talking with healthcare professionals extremely helpful, less than half of fathers do. ($p < 0.004$) Mothers cope to help manage the illness, fathers cope to distance themselves from stress. ($p < 0.02$) Both parents aim to cope to maintain family stability.	Strengths: Well-defined variables Weaknesses: Small sample size (n=23) Longitudinal study needed to evaluate long-term coping Population/ sample primarily Caucasian, may not be generalizable to other ethnicities/ cultures Little focus on fathers' use of coping skills, need for further investigation	Encourage both parents to communicate openly about their stressors regarding the illness, and how they individually cope. Assess the family for extraneous stressors (finances, death in the family, social issues, school bullying, etc.) that may have a negative impact on metabolic control and disease perception Encourage fathers participation as an active adjunct if not primary caregiver for the T1DM teen
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Plante, W., & Lobato, D. (2008). Psychosocial group interventions for children and adolescents with type 1 diabetes: The state of the literature. <i>Children's Health Care</i> , 37, 93-111.	No participants. Review of literature.	No variables. Purpose: To review the efficacy of group based psychological interventions designed to improve psychological adaptation, adherence to the treatment regimen, and diabetes-related medical outcomes in children and adolescents with type 1 diabetes.	No intervention. No data analysis.	Structured, more behaviorally focused programs demonstrate positive effects on emotional adjustment. ($r = 0.34; p < 0.03$) Many studies focused primarily on Caucasian families from middle class backgrounds. (73%) Group sessions are useful in resolving family conflict and seems to improve diabetes related adjustment. ($r = 0.4; p < 0.05$) Groups are more successful in treating adjustment than glyce-mic control. ($r = 0.23; p < 0.005$)	Strengths: Well defined goals. Research drawn from a variety of peer-reviewed sources. Weaknesses: No recommendations regarding the gap in literature dealing with low SES families of non-white ethnicities.	Treatment should be targeted at a specific intervention goals Selection of goals will depend on the age of the patient and other factors Assess families for actual or potential conflict Group sessions should consist of no more than 4 families. Evaluation tools must closely match goal to be evaluated. Group skills training using video-disc media results in longer lasting outcomes.
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Wysocki, T., Nansel, T., Holmbeck, G., Chen, R., Laffel, L., Anderson, B., & Weissberg-Benchel, J. (2009). Collaborative involvement of primary and secondary caregivers: Associations with youths' diabetes outcomes. <i>Journal of Pediatric Psychology</i> , 34(8), 869-881.	309 youths with T1DM and their primary and secondary caregivers Ages 9 -14.5 Four different pediatric clinics, each from a different U.S. region. 50% female Survey/Outcomes Study	IV: Collaborative parental involvement DV: T1DM outcomes Purpose: To analyze cross-sectional associations between T1D outcomes (adherence, glycemic control, quality of life, family conflict, depression, and self-efficacy) and scores on the Collaborative Parent Involvement (CPI) Scale.	No intervention DA: Univariate analysis of variance Pairwise comparisons between HbA1c and Diabetes Conflict in Families Scale MANCOVA	Youths who perceived both caregivers as demonstrating low collaborative involvement in diabetes management were consistently at risk of poor diabetes outcomes. ($r = 0.68$; $p < 0.005$) High collaborative involvement of the primary caregiver appears to be especially important and modest evidence that greater involvement of the secondary caregiver may have yielded some additive benefits beyond the contributions of the primary caregiver. ($r = 0.57$; $p < 0.05$) Involvement from primary caregivers ($p < 0.04$; $r = 0.69$) affect outcomes to a greater extent than secondary caregivers ($p < 0.04$; $r = 0.49$).	Strengths: Well defined goals. Sample gathered from differing regions of the country. Ethnic variation in sample. Acknowledgement of family income and medication regimen. Weaknesses: Need for longitudinal study. Collaborative behavior of participants may just be status quo, may not be representative of clinical population. Study criteria excludes single-parent families; impacts generalizability.	Assess caregivers for collaborative efforts and determine which is the primary caregiver Educate caregivers on benefits of collaborative involvement and address barriers to collaboration. Assess patient for effectiveness of glycemic control Encourage open discussion between teen and caregiver on how collaborative involvement can consistently exist in the home environment.
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<p>Harris, M.A., Freeman, K., & Beers, M. (2009). Family therapy for adolescents with poorly controlled diabetes: Initial test of clinical significance. <i>Journal of Pediatric Psychology</i>, 34(10), 1097-1107.</p>	<p>18 adolescents with T1DM and their parents for treatment group</p> <p>40 for comparison group</p> <p>Ages 13-18</p> <p>33% female</p> <p>Intervention/Questionnaire/Outcomes Study</p>	<p>IV: Teens and families who receive therapy</p> <p>DV: Degree of family conflict, family communication and teen HbA1c.</p> <p>Purpose:</p> <p>To examine a structured family therapy approach in promoting clinically meaningful improvements in parent-adolescent conflict in adolescents with poorly controlled diabetes.</p>	<p>Behavioral Family Systems Therapy (BFST), is a flexible, multi-component intervention targeting family communication and problem solving.</p> <p>Participants engaged in ten, 1.5 hours of role playing sessions over the course of 5-8 weeks.</p> <p>DA:</p> <p>t-score standard deviation</p> <p>Cohen's delta</p> <p>Glass' delta</p> <p>z-score</p>	<p>BFST showed improvement in mothers and teens' diabetes-related conflict (DRC).</p> <p>Pre-DRC: 0.86</p> <p>Post-DRC: 0.56 ($p < 0.003$)</p> <p>BFST is an effective intervention for families in varying social contexts and experience several psychosocial stressors.</p> <p>($p < 0.04$)</p>	<p>Strengths:</p> <p>Application of treatment in youths with poor health status, irregular clinic visits, single-parent homes, and in applied settings (e.g. home, neighborhood ,etc).</p> <p>Weaknesses:</p> <p>Low-standard deviations to demonstrate magnitude of change</p> <p>Lower questionnaire scores could be interpreted as regression of the mean.</p> <p>Small sample size</p> <p>Low recruitment rate (45%)</p> <p>T1DM and T2DM tested together; impacts generalizability</p>	<p>Assess family for psychosocial stressors that may impact effective diabetes management</p> <p>Encourage open communication and problem solving within the family</p> <p>Assess teen for effective glyce-mic control</p> <p>Use of the BFST is applicable to those experiencing poor glycemic control and exposed to several psycho-social stressors</p>
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<p>Mackey, E., Hilliard, M. E., Berger, S., Streisand, R., Chen, R., & Holmes, C. (2011). Individual and family strengths: An examination of the relation to disease management and metabolic control in youth with type 1 diabetes. <i>Families, Systems, & Health</i>, 29(4), 314-326. doi:10.1037/a0026589</p>	<p>257 adolescents with T1DM and one parent Ages 11-14 92% mothers Survey/Outcomes Study</p>	<p>IV: Personal and social-ecological factors of T1DM families DV: Metabolic control and disease management of the teen Purpose: To evaluate the interrelationship of intra-individual and social ecological factors of positive youth qualities and family cohesion to determine their association with disease management and metabolic control</p>	<p>No intervention. DA: Structural Equation Modeling (SEM) using Mplus 6. Overall model fit assessed with chi square analysis and standardized root mean square residual Measures: Youth participants completed the Youth Self Report, a behavior rating scale assessing general emotional and behavioral functioning, and The Positive Qualities subscale (YSR-PQ), which queried desirable personal characteristics. The Cohesion subscale of the Family Environment Scale indicated the adolescents' perceptions of their family's cohesiveness, the Diabetes Behavior Rating Scale (DBRS) assessed management of diabetes care, and blood glucose monitoring was assessed via self-report from both adolescents and parents by describing self-management tasks performed over the past 24 hours.</p>	<p>Youth with more positive qualities are more likely to perceive greater family cohesion. ($r = 0.67; p < 0.005$) No direct correlating between family cohesion and metabolic control. ($r = 0.12; p < 0.05$) Family cohesion relates to family involvement in management. ($r = 0.56; p < 0.05$) Positive attitudes in youth may enhance ability to draw more social support, improving control. ($r = 0.34; p < 0.07$) Positive family environments may be protective in the vulnerable transition time.</p>	<p>Strengths: Well defined goals. Acknowledgment of demographic differences in sample. Inclusion of both parent and youth perspectives Weaknesses: Cross-sectional study, needs longitudinal study to prove causality YSR-PQ only measures prosocial behaviors Sample reported high SES, which impacts generalizability of findings to lower SES populations.</p>	<p>AZ J\</p>
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<p>Berg, C. A., Skinner, M., Ko, K., Butler, J. M., Palmer, D. L., Butner, J., & Wiebe, D. J. (2009). The fit between stress appraisal and dyadic coping in understanding perceived coping effectiveness for adolescents with type 1 diabetes. <i>Journal of Family Psychology</i>, 23(4), 521-530. doi:10.1037/a0015556</p>	<p>252 adolescents with T1DM and their caregivers</p> <p>188 fathers</p> <p>Ages 10-14</p> <p>Survey/ Questionnaire Study</p>	<p>IV: Coping style (alone, parent, or shared)</p> <p>DV: Teen stress appraisal, metabolic control, depressive symptoms, self-care behaviors.</p> <p>Purpose: To examine whether perceived coping effectiveness (PCE) was associated with better diabetes management and was higher when adolescents' dyadic coping was matched to shared stress appraisals.</p>	<p>No intervention.</p> <p>DA: ANOVA Scheffe post-hoc comparisons</p> <p>Measures: The Children's Depression Inventory indicated the extent to which the child experienced depressive symptoms in the past 2 weeks, the Self-Care Inventory assessed adherence to the diabetes regimen over the preceding month, the Self-Efficacy for Diabetes Management Scale assesses the adolescents' confidence in being able to manage diabetes across problematic situations, and glycosylated hemoglobin levels were obtained from clinic visits over the preceding three months.</p>	<p>Mothers ($p < 0.04$; $r = 0.65$) are more likely than fathers ($p < 0.04$; $r = 0.44$) to participate in caregiving behaviors. ($p < 0.03$)</p> <p>Active involvement does not always result in lower stress appraisal. ($r = 0.11$; $p < 0.05$)</p> <p>Higher perceived coping effectiveness is associated with lower depressive symptoms ($p < 0.04$; $r = -0.45$), better adherence ($p < 0.04$; $r = 0.67$), and lower HbA1C ($p < 0.05$; $r = -0.56$).</p> <p>Collaborative involvement is associated with better coping when stress is viewed as shared and less effective when stress is viewed as "mine." ($r = 0.67$; $p < 0.05$)</p>	<p>Strengths: Clear definition of goals. Addressed dyadic factors which may influence stress appraisal.</p> <p>Weaknesses: Teen as sole source of information, need for fathers and mothers to gather more complete data sets. Predominately white sample with higher than average SES, low generalizability for low SES T1DM families of differing cultures. Participants were asked about only two stressful events in a week, need for more extensive analyses.</p>	<p>Assess for effective impaired communication between teen and parental units. Encourage parents and teens to engage in communication regarding shared and stressors dealt with alone. Assess for teen preference of stress coping mechanisms (e.g. shared, parent, or alone) and the "goodness of fit" between coping mechanisms and teen perception of stress ownership.</p>
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<p>Haugstvedt, A., Wentzel-Larsen, T., Graue, M., Søvik, O., & Rokne, B. (2010). Fear of hypoglycaemia in mothers and fathers of children with type 1 diabetes is associated with poor glycaemic control and parental emotional distress: a population-based study. <i>Diabetic Medicine: A Journal of The British Diabetic Association</i>, 27(1), 72-78.</p>	<p>115 children with T1DM Ages 10-15 Mothers = 103 Fathers = 97 Survey/ Questionnaire Study</p>	<p>IV: Parental fear of hypoglycemia, diabetic treatment factors DV: Emotional distress in mothers and fathers Purpose: To analyze, in a population-based study, the association between parental fear of hypoglycemia and the prevalence of hypoglycemia and diabetes treatment factors in children with Type 1 diabetes and emotional distress in mothers and fathers.</p>	<p>No intervention. DA: Generalized estimated equation analysis. SPSS statistical analysis. Bootstrap BCa intervals.</p>	<p>Parents perceptions ($p < 0.05$; $r = 0.69$) influence fear more than objective indicators of hypoglycemia ($p < 0.05$; $r = 0.05$). Higher worry associated with other somatic/mental disorders. ($r = 0.56$; $p < 0.005$) Higher worry associated with younger age of child. ($r = -0.65$; $p < 0.04$) Mothers ($p < 0.005$; $r = 0.7$) display greater fear than fathers ($p < 0.005$; $r = 0.34$). Higher hypoglycemia worry is associated with higher emotional distress. ($r = 0.34$; $p < 0.005$)</p>	<p>Strengths: Clearly defined goals. Differentiation between children who used insulin pump versus injection therapy. Weaknesses: Cross-sectional study. Self-report bias. Small sample size. Failed to address other confounding factors that may influence parental fear.</p>	<p>Assess families for emotional distress and diabetes related anxiety. Encourage open communication between parents regarding responsibility sharing and methods of coping with diabetes related stress. Encourage parent to use daily coping mechanisms to better handle stress and anxiety. Assist in identifying major causes of hypoglycemic related fear and how to better manage glycemic control.</p>
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<p>Ivey, J., Wright, A., & Dashiff, C. (2009). Finding the balance: adolescents with type 1 diabetes and their parents. <i>Journal Of Pediatric Health Care: Official Publication of National Association of Pediatric Nurse Associates & Practitioners</i>, 23(1), 10-18.</p>	<p>28 adolescents with T1DM and their parents. 8 male 20 female Ages 11-15 Semi-structured interview/ Descriptive Study</p>	<p>IV: Parent-teen interactions. DV: Themes and patterns of behavior related to diabetes management. Purpose: To describe the ways that parents and 11- to 15-year-old teens communicate and the recurrent themes and patterns of behavior that were revealed during brief interactions about issues related to diabetes management.</p>	<p>No intervention. DA: No specified data analysis tool utilized.</p>	<p>Adolescent anger and frustration centered on their need to have choices, make decisions, and receive recognition for positive aspects of their diabetes management. Parents express the underlying fear of harming or losing the adolescent because of some error or misjudgment in disease management. Parents had difficulty trusting self-care tasks to their teen, and relying on them to be honest about their blood glucose readings. Comments led to a discussion about learning to see diabetes as normal for that adolescent and the family. Parents repeatedly lectured the teen in a confrontational manner.</p>	<p>Strengths: Clearly defined goals. Report taken from both teen and parent points of view. Allowed for exploration of feelings and attitudes toward conflict and responsibility sharing. Weaknesses: Limited time for parents and teens to speak. Metabolic control may influence parent-teen relations. Overrepresentation of females and African Americans; poor generalizability.</p>	<p>Parents may need private opportunities in clinical settings to address their fears and frustrations. Nurses can intervene in parental frustration by helping parents to modify extremely high expectations and fostering negotiation of a partnership between the parent and adolescent in which they negotiate a shared goal for the adolescent's diabetes self-management. Encourage open discussion about fears and frustrations regarding trust, fear, anger, discounting, and normalization with regard to diabetes management.</p>
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Hanna, K., & Guthrie, D. (2001). Parents' and adolescents' perceptions of helpful and non-helpful support for adolescents' assumption of diabetes management responsibility. <i>Issues In Comprehensive Pediatric Nursing</i> , 24(4), 209-223.	16 adolescents with T1DM and their parents. Ages 11-18 Semi-structured interview.	IV: Helping behaviors of parents. DV: Teen and parent perceptions of helpful behaviors. Purpose: To identify parents' and adolescents' perceptions of helpful and nonhelpful support, specific to adolescents' assumption of responsibility for diabetes management.	No intervention. DA: Latent content analysis. Total parent descriptions of helpful support (n= 22) Non-helpful descriptions (n = 13) Adolescents helpful descriptions (n=19) Non-helpful descriptions (n = 6) Parents: Directive guidance (n=14) Non-directive support (n=4) Tangible assistance (n=4) Adolescents: Tangible assistance (n=11) Directive guidance (n=5)	Support has both positive and negative aspects, based of perceived need of guidance/help. Autonomy-seeking teens may find helping behaviors intrusive. Management is better when parents are involved. Important for parents to listen, explain, and openly negotiate. Authoritative parenting styles are crucial for positive growth. Non-tangible assistance is viewed as helpful by teens, whereas tangible assistance was not. Non-directive assistance was viewed as helpful by parents, and directive support was not.	Strengths: Clearly defined goals. Included report from both teen and parent. Weaknesses: Small sample size. Did not account for other factors influencing perspectives (e.g. teen perspective of self-efficacy in diabetes management). Parents in sample had higher education and teens were more adherent to diabetic regimens than those pairs who did not participate; poor generalizability.	Parents should be encouraged to use subtle encouragement, listening, reasoning, and suggesting. Encourage parent-teen discussion about responsibility sharing and which methods are most effective. Assess teen for poor adherence to diabetic regimen. Assess family for social disruption that may inhibit effective communication. Psychosocial interventions should aim at breaking down barriers to open communication.
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REFERENCES

- Aanstoot, H. (2009). DAWN Youth: a direct response to young people's attitudes, wishes, and needs. *Pediatric Diabetes*, 10, 1315-20.
- Amer, K. (2008). Children's views of their adaptation to type 1 diabetes mellitus. *Pediatric Nursing*, 34(4), 281-288.
- American Diabetes Association (ADA). (2013). American Diabetes Association Home Page. *American Diabetes Association*. Retrieved from <http://www.diabetes.org/diabetes-basics/diabetes-statistics/?loc=DropDownDB-stats>.
- Anderson, B. (2009). Psychosocial care for young people with diabetes. *Pediatric Diabetes*, 10, 133-8.
- Austin, S., Senécal, C., Guay, F., & Nouwen, A. (2011). Effects of gender, age, and diabetes duration on dietary self-care in adolescents with type 1 diabetes: a self-determination theory perspective. *Journal of Health Psychology*, 16(6), 917-928.
- Bearman, K., & La Greca, A. (2002). Assessing friend support of adolescents' diabetes care: the diabetes social support questionnaire-friends version. *Journal of Pediatric Psychology*, 27(5), 417-428.
- Berg, C. A., Skinner, M., Ko, K., Butler, J. M., Palmer, D. L., Butner, J., & Wiebe, D. J. (2009). The fit between stress appraisal and dyadic coping in understanding perceived coping effectiveness for adolescents with type 1 diabetes. *Journal of Family Psychology*, 23(4), 521-530. doi:10.1037/a0015556

- Carroll, A., Dimeglio, L., Stein, S., & Marrero, D. (2011). Contracting and monitoring relationships for adolescents with type 1 diabetes: A pilot study. *Diabetes Technology & Therapeutics, 13*, 543-549.
- Centers for Disease Control and Prevention. (2011). General Information - 2011 National Diabetes Fact Sheet - Publications - Diabetes DDT. *Centers for Disease Control and Prevention*. Retrieved from <http://www.cdc.gov/diabetes/pubs/gen>.
- Céspedes-Knadle, Y. M., & Muñoz, C. E. (2011). Development of a group intervention for adolescents with type 1 diabetes. *Journal for Specialists in Group Work, (36)*, 278-295.
- Court, J., Cameron, F., Berg-Kelly, K., & Swift, P. (2009). Diabetes in adolescence. *Pediatric Diabetes, 10*, 12185-194.
- Dashiff, C., Riley, B. H., Abdullatif, H., & Moreland, E. (2011). Parents' experiences supporting self-management of middle Adolescents with type 1 diabetes mellitus. *Pediatric Nursing, 37*, 304-310.
- Delamater, A. (2009). Psychological care of children and adolescents with diabetes. *Pediatric Diabetes, 10*, 12175-184.
- Fernandes, R., Wales, S., Crisp, J., & Kyngas, H. (2011). Modification and testing of the chronic disease compliance instrument to measure treatment compliance in adolescents with diabetes. *Journal of Clinical Nursing, 20*, 1273-1281.
- Greco, P., Pendley, J., McDonell, K., & Reeves, G. (2001). A peer group intervention for adolescents with type 1 diabetes and their best friends. *Journal of Pediatric Psychology, 26*(8), 485-490.

- Hains, A., Berlin, K., Davies, W., Smothers, M., Sato, A., & Alemzadeh, R. (2007). Attributions of adolescents with type 1 diabetes related to performing diabetes care around friends and peers: the moderating role of friend support. *Journal of Pediatric Psychology*, 32(5), 561-570.
- Hanna, K., & Guthrie, D. (2001). Parents' and adolescents' perceptions of helpful and nonhelpful support for adolescents' assumption of diabetes management responsibility. *Issues in Comprehensive Pediatric Nursing*, 24(4), 209-223.
- Harris, M.A., Freeman, K., & Beers, M. (2009). Family therapy for adolescents with poorly controlled diabetes: Initial test of clinical significance. *Journal of Pediatric Psychology*, 34(10), 1097-1107.
- Harris, M. A., Greco, P., Wysocki, T., & White, N. H. (2001). Family therapy with adolescents with diabetes: A litmus test for clinically meaningful change. *Families, Systems, & Health*, 19(2), 159-168. doi:10.1037/h0089445
- Haugstvedt, A., Wentzel-Larsen, T., Graue, M., Søvik, O., & Rokne, B. (2010). Fear of hypoglycaemia in mothers and fathers of children with type 1 diabetes is associated with poor glycaemic control and parental emotional distress: a population-based study. *Diabetic Medicine: A Journal of the British Diabetic Association*, 27(1), 72-78.
- Helgeson, V. S., Lopez, L. C., & Kamarck, T. (2009). Peer relationships and diabetes: Retrospective and ecological momentary assessment approaches. *Health Psychology*, 28(3), 273-282. doi:10.1037/a0013784

- Hoey, H. (2009). Psychosocial factors are associated with metabolic control in adolescents: research from the Hvidoere Study Group on Childhood Diabetes. *Pediatric Diabetes*, 10, 139-14.
- Ivey, J., Wright, A., & Dashiff, C. (2009). Finding the balance: adolescents with type 1 diabetes and their parents. *Journal of Pediatric Health Care: Official Publication of National Association of Pediatric Nurse Associates & Practitioners*, 23(1), 10-18.
- Jackson, C., Richer, J., & Edge, J. (2008). Sibling psychological adjustment to type 1 diabetes mellitus. *Pediatric Diabetes*, 9(4), 308-311.
- Jaser, S. S., & White, L. E. (2011). Coping and resilience in adolescents with type 1 diabetes. *Child: Care, Health & Development*, 37, 335-342.
- Kail, R. V., & Cavanaugh, J. C. (2012). Rights of passage: Physical and cognitive developments in adolescents. In J. Perkins, K. Makarewycz, & P. Leeds (Eds.), *Human development: A life-span view* (5th ed.; pp. 248-285). Belmont, CA: Wadsworth Cengage Learning.
- Konradsdottir, E., & Svavarsdottir, E. (2011). How effective is a short-term educational and support intervention for families of an adolescent with type 1 diabetes? *Journal for Specialists in Pediatric Nursing*, 16, 295-304.
- La Greca, A., & Bearman, K. (2002). The diabetes social support questionnaire-family version: evaluating adolescents' diabetes-specific support from family members. *Journal of Pediatric Psychology*, 27(8), 665-676.

- Lehmkuhl, H., Merlo, L., Devine, K., Gaines, J., Storch, E., Silverstein, J., & Geffken, G. (2009). Perceptions of type 1 diabetes among affected youth and their peers. *Journal of Clinical Psychology in Medical Settings*, 16(3), 209-215.
- Mackey, E., Hilliard, M. E., Berger, S., Streisand, R., Chen, R., & Holmes, C. (2011). Individual and family strengths: An examination of the relation to disease management and metabolic control in youth with type 1 diabetes. *Families, Systems, & Health*, 29(4), 314-326. doi:10.1037/a0026589
- Malik, J., & Koot, H. (2011). Assessing diabetes support in adolescents: Factor structure of the Modified Diabetes Social Support Questionnaire (M-DSSQ-Family). *Pediatric Diabetes*, 12, 258-265.
- McConnell, E., Harper, R., Campbell, M., & Nelson, J. (2001). Achieving optimal diabetic control in adolescence: the continuing enigma. *Diabetes/Metabolism Research and Reviews*, 17(1), 67-74.
- Morrison, S., Dashiff, C., Abdullatif, H., & Moreland, E. (2012). Parental separation anxiety and diabetes self-management of older adolescents: A pilot study. *Pediatric Nursing*, 38, 88-95.
- Mulvaney, S., Hood, K., Schlundt, D., Osborn, C., Johnson, K., Rothman, R., & Wallston, K. (2011). Development and initial validation of the barriers to diabetes adherence measure for adolescents. *Diabetes Research & Clinical Practice*, 94, 77-83.

- Naar-King, S., Podolski, C., Ellis, D. A., Frey, M. A., & Templin, T. (2006). Social ecological model of illness management in high-risk youths with type 1 diabetes. *Journal of Consulting and Clinical Psychology, 74*(4), 785-789. doi:10.1037/0022-006X.74.4.785
- Nansel, T., Rovner, A., Haynie, D., Iannotti, R., Simons-Morton, B., Wysocki, T., & Laffel, L. (2009). Development and validation of the collaborative parent involvement scale for youths with type 1 diabetes. *Journal of Pediatric Psychology, 34*(1), 30-40.
- Paterson, B., & Brewer, J. (2009). Needs for social support among parents of adolescents with diabetes. *Journal of Nursing & Healthcare of Chronic Illnesses, 1*, 177-185.
- Pendley, J., Kasmien, L., Miller, D., Donze, J., Swenson, C., & Reeves, G. (2002). Peer and family support in children and adolescents with type 1 diabetes. *Journal of Pediatric Psychology, 27*(5), 429-438.
- Pereira, M., Berg-Cross, L., Almeida, P., & Machado, J. (2008). Impact of family environment and support on adherence, metabolic control, and quality of life in adolescents with diabetes. *International Journal of Behavioral Medicine, 15*(3), 187-193.
- Plante, W., & Lobato, D. (2008). Psychosocial group interventions for children and adolescents with type 1 diabetes: The state of the literature. *Children's Health Care, 37*, 93-111.
- Ricci, S. S., & Kyle, T. (2009). Growth and development of the adolescent. In S. Carmen (Ed.), *Maternity and pediatric nursing* (pp. 883-884). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Sato, A., Berlin, K., Hains, A., Davies, W., Smothers, M., Clifford, L., & Alemzadeh, R. (2008).

Teacher support of adherence for adolescents with type 1 diabetes: Preferred teacher support behaviors and youths' perceptions of support. *Diabetes Educator*, 34, 866-873.

Storch, E., Lewin, A., Silverstein, J., Heidgerken, A., Strawser, M., Baumeister, A., & Geffken, G. (2004). Peer victimization and psychosocial adjustment in children with type 1 diabetes. *Clinical Pediatrics*, 43(5), 467-471.

Tan, S., Shafiee, Z., Wu, L., Rizal, A., & Rey, J. (2005). Factors associated with control of type I diabetes in Malaysian adolescents and young adults. *International Journal of Psychiatry In Medicine*, 35(2), 123-136.

Wysocki, T., Nansel, T., Holmbeck, G., Chen, R., Laffel, L., Anderson, B., & Weissberg-Benchel, J. (2009). Collaborative involvement of primary and secondary caregivers: Associations with youths' diabetes outcomes. *Journal of Pediatric Psychology*, 34(8), 869-881.

Vesco, A., Anderson, B., Laffel, L., Dolan, L., Ingerski, L., & Hood, K. (2010). Responsibility sharing between adolescents with Type 1 diabetes and their caregivers: Importance of adolescent perceptions on diabetes management and control. *Journal of Pediatric Psychology*, 35, 1168-1177.