

ISPAD Clinical Practice Consensus Guidelines 2014 Compendium

Psychological care of children and adolescents with type 1 diabetes

Delamater AM, de Wit M, McDarby V, Malik J, Acerini CL. Psychological care of children and adolescents with type 1 diabetes. *Pediatric Diabetes* 2014; 15 (Suppl. 20): 232–244.

Alan M Delamater^a, Maartje de Wit^b, Vincent McDarby^c, Jamil Malik^d and Carlo L Acerini^e

^aDepartment of Pediatrics, University of Miami Miller School of Medicine, Miami, FL, USA; ^bDepartment of Medical Psychology, EMGO Institute for Health & Care Research, VU University Medical Center, Amsterdam, Netherlands;

^cDepartment of Psychology, National Children's Research Centre and Our Lady's Children's Hospital, Dublin, UK;

^dNational Institute of Psychology, Center of Excellence, Quaid-i-Azam University, Islamabad, Pakistan; and

^eDepartment of Paediatrics, University of Cambridge, Cambridge, UK

Key words: adolescents – care – children – diabetes – psychology

Corresponding author: Alan M. Delamater, Department of Pediatrics, University of Miami, Miami, FL 33136, USA.
Tel: 305.243.6857;
fax: 305.243.4512;
e-mail: adelamater@med.miami.edu

Editors of the ISPAD Clinical Practice Consensus Guidelines 2014 Compendium: Carlo Acerini, Carine de Beaufort, Maria Craig, David Maahs, Ragnar Hanas.

This article is a chapter in the *ISPAD Clinical Practice Consensus Guidelines 2014 Compendium*. The complete set of guidelines can be found for free download at www.ispad.org. The evidence grading system used in the ISPAD Guidelines is the same as that used by the American Diabetes Association. See page 3 (the Introduction in *Pediatric Diabetes* 2014; 15 (Suppl. 20): 1–3).

Executive summary and Recommendations

The following summary and recommendations build upon the previous ISPAD Guidelines (1) and are consistent with the latest statements and guidelines issued by the American Diabetes Association (2), Australia (APEG – Clinical Practice Guidelines, www.nhmrc.gov.au/publications/pdf/cp102.pdf), Canada (www.diabetes.ca/cpg2003), and the UK (www.nice.org.uk/pdf/type1diabetes).

- Young people with diabetes appear to have a greater incidence of depression, anxiety, psychological distress, and eating disorders compared to their healthy peers (A).
- Children and young people with chronic poor metabolic control, including recurrent diabetic ketoacidosis (DKA), are more likely to have underlying psychosocial problems or psychiatric disorders than children in good metabolic control (A, B).

- Resources should be made available to include professionals with expertise in the mental and behavioral health of children and adolescents within the interdisciplinary diabetes health care team. These mental health specialists should include psychologists, social workers, and psychiatrists (E).
- Mental health professionals should be available to interact not only with patients and families at clinic visits to conduct screening and more complete assessments of psychosocial functioning, but also to support the diabetes team in the recognition and management of mental health and behavior problems (A, E).
- There should be easy access to consulting psychiatrists for cases involving severe psychopathology and the potential need for psychotropic medications (E).
- All mental and behavioral health specialists should have training in diabetes and its management (E).
- The interdisciplinary diabetes health care team should maintain regular, consistent, and uninterrupted contact with patients and their families. When clinic visits are missed or not frequent, other modes

- of contact such as phone, SMS texting, or e-mail should be made available (B, E).
- Young people with diabetes are at increased risk for information processing weaknesses and learning problems, especially if there is a background of early diabetes onset, severe hypoglycemia, or chronic hyperglycemia (B).
 - Assessment of developmental progress in all domains of quality of life (i.e., physical, intellectual, academic, emotional, and social development) should be conducted on a routine basis (A, B, E).
 - Quality of life can be reliably measured with good clinical utility (A).
 - It is especially important to monitor the school performance of children who developed diabetes before age 5yr, and with a history of significant hypoglycemic episodes and/or chronic hyperglycemia at early ages (B). These children, as well as all children experiencing learning difficulties at school, should be referred for a psycho-educational or neuropsychological evaluation in order to determine if learning disabilities are present (B).
 - Specific diabetes care plans should be formulated for the school setting and training conducted with school staff concerning diabetes management (B, E).
 - Routine assessment should be made of developmental adjustment to and understanding of diabetes management, including diabetes-related knowledge, insulin adjustment skills, goal setting, problem-solving abilities, regimen adherence, and self-care autonomy and competence. This is especially important during late childhood and prior to adolescence when in many families the child may take on diabetes management responsibilities without adequate maturity for effective self-care (B).
 - Identification of psychosocial adjustment problems, depression, eating disorders, and other psychiatric disorders should be performed at planned intervals and by appropriately trained mental health professionals (B, E). These assessments are particularly important in young people not achieving treatment goals or who exhibit chronically poor metabolic control (e.g., high HbA1c, recurrent DKA) (B, E).
 - Several family factors including levels of family cohesion, agreement about diabetes management responsibilities, and levels of supportive and collaborative problem-solving behaviors influence treatment regimen adherence and glycemic control (B, C). Family conflict is associated with lower regimen adherence and poor glycemic control (B, C).
 - The interdisciplinary team should assess general family functioning (conflict, cohesion, adaptability, and parental psychopathology) and diabetes-related functioning (communication, parental involvement and support, and roles and responsibilities for self-care behaviors) especially when there is evidence of cultural, language, or family problems or difficulties in adjustment to diabetes (A, B, E).
 - The interdisciplinary team should aim to provide preventive interventions for patients and families (including training parents in effective behavior management skills) at key developmental times, particularly after diagnosis and prior to adolescence (A, E). These interventions should emphasize appropriate family involvement and support (i.e., teamwork) in diabetes management, effective problem-solving and self-management skills, and realistic expectations about glycemic control (A, E).
 - Evidence-based psychosocial, behavioral, or psychiatric interventions should be made available for patients or families exhibiting conflict, disordered communication, behavioral or psychiatric difficulties, or adherence problems affecting glycemic control (A, B, E). Developmental needs of children and adolescents should be considered while planning interventions incorporating social, emotional, and tangible support (C, E).
 - In counseling young people and parents regarding advances in diabetes management, and encouraging the intensification of insulin regimens, motivational interviewing may be useful (A). This may help in clarifying patient and parental goals and resolve ambivalence about regimen intensification. Patients should not be denied access to regimen intensification based on perceptions of limited competence, as even youth with low self-management competence have been shown to improve with intensive insulin therapy (A).
 - Adolescents should assume increasing responsibility for diabetes management tasks but with continuing, mutually agreed parental involvement and support (A, E). The transition to adult diabetes care should be discussed, negotiated, and carefully planned with adolescents, their parents, and the adult diabetes team well in advance of the actual transfer to adult care (E) (see ISPAD Clinical Practice Consensus Guidelines on 'Diabetes in Adolescence' – Assessment and management of hypoglycemia in children and adolescents with diabetes).

Introduction

A substantial research base developed over the past 30 yr provides evidence for the significant role of psychosocial factors in the management of type

1 diabetes in children and adolescents (1–5). We review the main findings from studies of psychological adjustment, psychiatric disorders, neurocognitive and educational functioning, family dynamics, social support, stress and coping, quality of life, and behavioral interventions in children and adolescents with type 1 diabetes. Based on these research findings, recommendations for optimal psychological care are offered.

The ISPAD Consensus Guidelines 2000 stated that ‘Psychosocial factors are the most important influences affecting the care and management of diabetes’, and went on to make the following three general recommendations (6):

- (i) Social workers and psychologists should be part of the interdisciplinary health care team.
- (ii) Overt psychological problems in young persons or family members should receive support from the diabetes care team and expert attention from mental health professionals.
- (iii) The diabetes care team should receive training in the recognition, identification, and provision of information and counseling on psychosocial problems related to diabetes.

After reviewing the evidence base on psychological issues and interventions for children and adolescents with type 1 diabetes, these general recommendations remain appropriate and are developed further with more specific recommendations for psychological care.

Psychological adjustment and psychiatric disorders

Young people with diabetes appear to have a greater incidence of depression, anxiety, psychological distress, and eating disorders compared to their healthy peers (7, 8). Research findings indicate that children with type 1 diabetes are at risk for adjustment problems during the initial period of adaptation after diagnosis (9, 10). When adjustment problems exist, children are at higher risk for continued adjustment difficulties (10–13). In a 10-yr prospective study from the diagnosis of type 1 diabetes, adolescents were at high risk for various psychiatric diagnoses; females were more likely than males to receive a diagnosis, and half of those with a history of poor glycemic control had a psychiatric diagnosis (14). However, a recent longitudinal study from adolescence into emerging adulthood did not reveal group differences in psychosocial adjustment (15, 16). More recent studies suggest differences between children with and without diabetes appear to be smaller (7). Nevertheless, about 15% of youth with diabetes report elevated levels of psychological

distress, with potential negative consequences for self-care, and studies indicate that behavioral problems are associated with poor glycemic control (17, 18).

Studies indicate that depression and anxiety are related with less frequent glucose monitoring and poorer glycemic control (19, 20). Results from the SEARCH study in the USA found that 14% of youth with diabetes reported mild depression and 8.6% reported moderate to severe depression; girls reported more depressive symptoms than boys, and depression was associated with poorer glycemic control and increased diabetes-related hospitalizations (21). A recent meta-analysis showed that depression is associated with poorer treatment adherence, and this association is even stronger in more recent studies; the association between depression and glycemic control is small to moderate, and smaller in more recent studies (22). Prospective studies indicate that greater depressive symptoms predict less frequent blood glucose monitoring, poorer quality of life, and poorer glycemic control over time (23, 24). Children with recurrent DKA are more likely to have psychiatric disorders than children in good glycemic control (25). Poor glycemic control has also been associated with a number of other psychosocial problems including anxiety (20), poor self-esteem, and diabetes-distress (26–28). When psychological adjustment problems persist into late adolescence, there is evidence indicating greater risk for poor diabetes management during early adulthood (29, 30). However, more research in this area is needed.

Youth who are depressed are also at an increased risk for disordered eating behavior (31). There is evidence that adolescents with diabetes, especially girls, have a higher incidence of disturbed eating behavior and eating disorders (8). It is estimated that 7% of adolescent girls with type 1 diabetes may meet diagnostic criteria for an eating disorder, a rate twice as common as in girls without diabetes (8). Disordered eating behavior is more prevalent in adolescent girls with type 1 diabetes (40%) than their peers (33%) (31). Results of a recent meta-analysis indicated that eating disorders are associated with poor glycemic control (8), although a recent longitudinal study did not show this association (31). Even at subclinical levels, glycemic control has been observed to worsen with increasing symptoms of eating disorder (32–34). Without intervention, disordered eating and insulin manipulation may worsen over time and increase the risk of serious health complications (35–37)

Neurocognitive and school functioning

Studies of neurocognitive functioning indicate that young people with diabetes are at increased risk for information processing weaknesses and learning problems, especially with early diabetes onset (38–41),

history of severe hypoglycemia (40–42), and chronic hyperglycemia, even among very young children (43, 44). Research also indicates that diabetic youths are more likely to have learning problems, with such problems more frequent among boys than girls (45, 46). Academic achievement, school performance, and classroom attention are lower in children with poor metabolic control (47–49).

Prospective studies of newly diagnosed children have demonstrated mild neuropsychological deficits 2 yr after diagnosis, with reduced speed of information processing and decrements in conceptual reasoning and acquisition of new knowledge (14). Such problems were predicted by early onset of diabetes (prior to age 4 yr) and were related to poorer visuospatial functioning and both recurrent severe hypoglycemia and hyperglycemia, which was related to decreased memory and learning capacity (50). Study of neuropsychological functioning 12 yr after diagnosis found that children with diabetes performed more poorly on working memory than control children (51). Children with early onset diabetes (before age 4 yr) showed poorer sustained and divided attention and mental efficiency, while those with a history of recurrent severe hypoglycemia performed more poorly on measures of verbal ability, working memory, and non-verbal processing speed and those with chronic hyperglycemia showed poorer working memory (51). The results of meta-analytic studies indicate that children with type 1 diabetes have a variety of mild cognitive impairments and slightly reduced overall intellectual functioning (52, 53).

Parents report considerable anxiety when their children are in school, are not aware of federal laws to accommodate their children with diabetes, and believe that schools do not facilitate optimal treatment for their children while in school settings (54). In describing school experiences of students with diabetes, better glycemic control and quality of life occurs when school personnel and friends receive some training in diabetes and its management (55).

Family functioning

The research literature has consistently demonstrated that family factors are integral for the management of diabetes in children (1). The findings from a number of cross-sectional and prospective studies have shown that high levels of family cohesion, authoritative parenting, agreement about diabetes management responsibilities, supportive behaviors, and collaborative problem-solving are associated with better regimen adherence and glycemic control, while conflict, diffusion of responsibilities, and regimen-related conflict have been associated with worse regimen adherence and glycemic control (56–68). Family

conflict and negative affect related to blood glucose monitoring has also been associated with depression (19). Having a collaborative relationship between youth and their parents with shared responsibilities for diabetes management is associated not only with better regimen adherence, but also with improved emotional functioning (62, 69). Significant family dysfunction for the majority of families has been observed in clinical studies of adolescents with recurrent DKA (25, 64, 70, 71). Studies have also shown sociodemographic factors such as single-parenthood (72–74) and lower income and ethnic minority status (75–81) are associated with greater risk for poor control of diabetes.

It is important to note that many parents have psychological problems after the diagnosis of type 1 diabetes in their children. One recent review indicated that on average 33.5% of parents report distress at diagnosis, with 19% of parents reporting distress 1 to 4 yr after diagnosis (82). Mothers appear to be at risk for psychological adjustment problems after their child's diagnosis, with clinically significant depression noted in approximately one third of mothers; however, most of these adjustment problems are resolved within the first year after the child's diagnosis (83). Fewer studies have addressed psychological functioning in fathers. One study found that 24% of mothers and 22% of fathers met criteria for a diagnosis of post-traumatic stress disorder 6 wk after their child had been diagnosed (84). Another study found that psychological maladjustment of fathers predicted poor glycemic control in children 5 yr after diagnosis (85). Fear of hypoglycemia has also been found to be common in parents of children with diabetes (86) and is associated with emotional distress and poorer glycemic control in children (87).

Social support

Social support from parents and other family members is especially important for children and adolescents with type 1 diabetes. Research has shown that family members who provide high levels of support for diabetes care have youngsters who adhere better to their diabetes regimen (58). It was also noted that levels of diabetes-specific family support were inversely related to youngsters' age, with older children and adolescents reporting significantly less family support for diabetes. Youths may receive instrumental support from their families and also considerable emotional support from their friends (58, 88–91). When youth attribute negative peer reactions to their self-care, they are more likely to have adherence difficulties and increased diabetes stress, which in turn worsens glycemic control (92). Fear of stigmatization and sense of autonomy appeared to be major barriers withholding adolescents to solicit required support from peers (88). Poor peer

relations has been associated with decreased regimen adherence and worse glycemic control over time, while more family support predicted better glycemic control (93). Providing support to parents after the diagnosis of diabetes of their child is an important need and can promote better diabetes management (94, 95).

Stress and coping

Studies have shown that children with high life stress tend to have worse glycemic control (92, 96, 97). Daily stressors faced by younger children are usually related to friends/peers and siblings, and their coping behaviors include choosing an alternate activity and taking personal responsibility (98). Diabetes-specific stress has also been linked to poor glycemic control (28, 27). Research examining attributional and coping styles has indicated that youths in poor metabolic control are more likely to use the learned helplessness style (99) and engage in avoidance and wishful thinking in response to stress (100), while youths in good glycemic control have high levels of self-efficacy (101) and engage in active coping (102–106). A longitudinal study suggested a reciprocal relationship between active coping and better glycemic control, while avoidance coping was linked with worse glycemic control and increased psychological stress (103). Maladaptive coping has also been associated with poor regimen adherence (107). Resilience is associated with better diabetes management, quality of life, and glycemic control (104, 108).

Research addressing the health belief model in adolescents indicate that beliefs related to the seriousness of diabetes, personal vulnerability to complications, costs of regimen adherence, and beliefs in the efficacy of treatment have been associated with both regimen adherence and glycemic control (109–111). Studies have also shown that their personal models of illness belief for diabetes were associated with psychological adjustment and regimen adherence: greater impact of diabetes was related to increased anxiety, while beliefs about the effectiveness of treatment predicted better dietary self-care (112). Personal model beliefs about diabetes were also shown to mediate the relationship between personality variables (emotional stability and conscientiousness) and self-care behaviors (113). Studies of health risks associated with diabetes indicate that youth underestimate their own risks while acknowledging greater risks of diabetes attributed to other youths (114).

Identification and improvements in primary caregivers (mothers') coping may have the potential to improve both maternal and adolescent outcomes (115–119). Children with parental dyads exhibiting the negotiator coping pattern had better glycemic control than children with parents classified as avoiders or doers (120).

Quality of life

In general, children with diabetes rate their own quality of life as similar to their healthy peers (121). However, parents tend to rate their child's quality of life somewhat lower (122–124). Boys report better quality of life as well as youth with longer diabetes duration and those from a better socioeconomic background (121, 125–129). Lower quality of life seems associated with depression (130) and a negative family environment, especially diabetes conflicts (131). Less favorable quality of life also appears to be related with youths' perceptions that diabetes is upsetting, difficult to manage, and stressful, as well as fear of hypoglycemia (131, 132). There is some evidence that better quality of life is associated with better glycemic control, but the relationship between glycemic control and quality of life appears modest (124, 133–135). In a prospective study, poorer quality of life predicted subsequent poor glycemic control via less frequent blood glucose monitoring (136). Quality of life does not appear to be adversely affected by use of the insulin pump (127, 137, 138), and may be associated with improved quality of life (130). In addition, use of continuous glucose monitoring does not seem to adversely affect quality of life (139).

Psychosocial and behavioral interventions

Previous systematic reviews of the literature indicate that a number of controlled studies have shown the efficacy of psychosocial and behavioral interventions for children and adolescents with diabetes, although this literature is not without some methodological limitations (3, 4, 140–142). Most of these interventions have included the family as an integral part of treatment.

The results of these studies indicate that family-based, behavioral procedures such as goal-setting, self-monitoring, positive reinforcement, behavioral contracts, supportive parental communications, and appropriately shared responsibility for diabetes management have improved regimen adherence and glycemic control (141, 143). In addition, these interventions have improved the parent–adolescent relationship (141, 144–146), and improved regimen adherence (146). Studies of behavioral family systems therapy with diabetes-specific tailoring have shown improvements in family conflict and regimen adherence (147) as well as improved glycemic control over 18 months (148). Controlled research has demonstrated this approach to improve parent–adolescent communication and problem-solving which in turn was associated with improvements in glycemic control (149).

Given the crisis that diagnosis presents for children and families, the period just after diagnosis presents opportunities for intervention. Interdisciplinary intervention programs have been described and reported

to improve outcomes (150, 151). Psycho-educational interventions with children and their families that promote problem-solving skills and increase parental support early in the disease course have been shown to improve long-term glycemic control in children (152). Other trials involving psychosocial intervention after diagnosis showed improved family functioning without improved glycemic control (153, 154).

Research has shown that when parents allow older children and adolescents to have self-care autonomy without sufficient cognitive and social maturity, youths are more likely to have problems with diabetes management (155). Thus, a critical aspect of behavioral family management of diabetes is finding ways for parents and family members to remain involved and supportive, but not intrusive, in their children's daily care.

An intervention based on family-focused teamwork increased family involvement without causing family conflict or adversely affecting youth quality of life, and helped prevent worsening of glycemic control (156). A psycho-educational intervention delivered by a 'care ambassador' at regular outpatient visits was shown to improve the frequency of outpatient visits, and reduced acute adverse outcomes such as hypoglycemia and emergency department visits (157).

Another approach utilized intensive home-based multi-systemic therapy with inner city adolescents in chronically poor metabolic control, a patient population that has not received much attention in the intervention literature. Initial studies of this approach suggested that it had potential to improve outcomes (158). The results of a larger randomized trial indicated this approach improved frequency of blood glucose monitoring, reduced inpatient admissions, improved glycemic control, and reduced medical costs (159, 160). A more recent study demonstrated reduced hospitalizations and costs for this high-risk group of adolescent patients using multi-systemic therapy (161).

Peer group interventions have also been evaluated. Results indicate that peer group support and problem-solving can improve short-term glycemic control (162). Training in group coping skills improved glycemic control and quality of life for adolescents involved in intensive insulin regimens (163–165). Stress management, problem-solving, and coping skills training delivered in small groups of youths has reduced diabetes-related stress (166, 167), improved social interaction (168), and increased glucose monitoring and improved glycemic control (169).

It is important to maintain regular ongoing contact with families, as research findings indicate that children who have infrequent and irregular visits with the health care team are more likely to have glycemic control problems (170, 171). Research indicates that early adolescence represents a high risk time for diabetes management, with worsening of adherence

observed over time (172), which may be due to decreased parental involvement.

Motivational interviewing appears to be a promising approach for adolescents, with initial studies showing improved glycemic control (173, 174). A larger multi-center randomized trial demonstrated that motivational interviewing with adolescents improved long-term glycemic control and quality of life (175). Another study targeting motivation with an individualized personal trainer showed improved glycemic outcomes in older but not younger adolescents (176). More recently it was demonstrated that this approach had long-term positive effects on glycemic control in older adolescents (177).

Several recent studies have examined coping skills training with younger, school-aged children. Results indicate that this approach had some favorable effects on life satisfaction and family functioning (178). Although coping skills training for younger children was not shown to be more effective than an educational intervention, results from controlled studies do support the use of group interventions for children in this age range (179). Furthermore, coping skills training with parents of young children has also been shown to be helpful, although outcomes were not significantly different from the control group that received educational support (116).

More studies have recently been conducted on behavioral interventions integrated with outpatient medical clinic appointments. For example, monitoring and discussing quality of life issues with adolescent patients was found to improve psychosocial functioning over time (180). A family-centered program integrated with routine clinic appointments led to improvements in glycemic control and parental involvement when families participated in two or more such sessions over the course of a 12-month follow-up (181). In a large multi-site randomized trial, a family teamwork intervention delivered at the time of quarterly outpatient clinic visits led to improved glycemic control for young adolescents, but effects were not as strong as that for older children (182, 183).

Recent studies have examined the use of the Internet to deliver behavioral interventions. For example, it was demonstrated that using an Internet program for diabetes problem-solving led to significant improvements in diabetes management and problem-solving, with stable glycemic control (184). This approach was particularly sensitive to diabetes management barriers with regard to social issues, time pressures, and dealing with emotions (185). Another study examined the effects of coping skills training for adolescents delivered over the Internet, compared with an Internet-delivered educational intervention. The results of this randomized controlled multi-site trial indicated clinical improvements for youth in

both groups, supporting the concept that behavioral interventions can be effectively applied to youth with type 1 diabetes using the Internet (186).

A meta-analysis of intervention studies to promote regimen adherence in youth with type 1 diabetes was conducted and found 15 studies that met criteria for analysis (187). While the results indicated small effect sizes for improvements in glycemic control, multi-component interventions addressing psychosocial and emotional processes had stronger effects. In a review of family-centered interventions, nine studies were examined and found that such interventions improve glycemic control and family functioning while reducing family conflict (188).

In summary, the results of controlled intervention research have shown that family-based interventions utilizing positive reinforcement and behavioral contracts, communication, and problem-solving skills training, negotiation of diabetes management goals, and collaborative parental involvement have led not only to improved regimen behaviors and glycemic control, but also to improved family relationships. Group interventions for young people with diabetes targeting coping and stress management skills have also shown positive effects on regimen adherence, glycemic control, and quality of life. Individual interventions with adolescents have shown motivational interviewing to improve long-term glycemic control and psychosocial outcomes. There is growing evidence supporting the use of the Internet to deliver behavioral interventions.

Conflicts of interest

The authors have declared no conflicts of interest.

References

1. DELAMATER AM. ISPAD Clinical Practice Consensus Guidelines 2009 Compendium: psychological care of children and adolescents with diabetes. *Pediatr Diabetes* 2009; 10 (Suppl. 12): 175–184.
2. SILVERSTEIN J, KLINGENSMITH G, COPELAND K, et al. Care of children and adolescents with type 1 diabetes: a statement of the American Diabetes Association. *Diabetes Care* 2005; 28: 186–212.
3. HAMPSON SE, SKINNER T, HART J, et al. Behavioral interventions for adolescents with type 1 diabetes: how effective are they? *Diabetes Care* 2000; 23: 1416–1422.
4. WINKLEY K, LANDAU S, EISLER I, ISMAIL K. Psychological interventions to improve glycaemic control in patients with type 1 diabetes: systematic review and meta-analysis of randomised controlled trials. *BMJ* 2006; 333: 65.
5. LARON Z, GALATZER A, KARGER S. Psychological aspects of diabetes in children and adolescents. *Pediatr Adolesc Endocrinol* 1982; 10: 1–247.

6. ISPAD. Consensus Guidelines for the Management of Type 1 Diabetes Mellitus in Children and Adolescents, 2000.
7. REYNOLDS K, HELGESON V. Children with diabetes compared to peers: depressed? distressed? *Ann Behav Med* 2011; 42: 29–41.
8. YOUNG V, EISER C, JOHNSON B, et al. Eating problems in adolescents with type 1 diabetes: a systematic review with meta-analysis. *Diabet Med* 2013; 30: 189–198.
9. KOVACS M, FEINBERG T, PAULAUSKAS S, FINKELSTEIN R, POLLOCK M, CROUSE-NOVAK M. Initial coping responses and psychosocial characteristics of children with insulin-dependent diabetes mellitus. *J Pediatr* 1985; 106: 827–834.
10. GREY M, CAMERON ME, LIPMAN TH, THURBER FW, et al. Psychosocial status of children with diabetes in the first 2 years after diagnosis. *Diabetes Care* 1995; 18: 1330–1336.
11. JACOBSON AM, HAUSER ST, LAVORI P, et al. Family environment and glycemic control: a four-year prospective study of children and adolescents with insulin-dependent diabetes mellitus. *Psychosom Med* 1994; 56: 401–409.
12. KOVACS M, HO V, POLLOCK MH. Criterion and predictive validity of the diagnosis of adjustment disorder: a prospective study of youths with new-onset insulin-dependent diabetes mellitus. *Am J Psychiatr* 1995; 152: 523–528.
13. SCHWARTZ DD, CLINE VD, AXELROD ME, ANDERSON BJ. Feasibility, acceptability, and predictive validity of a psychosocial screening program for children and youth newly diagnosed with type 1 diabetes. *Diabetes Care* 2011; 34: 326–331.
14. NORTHAM EA, ANDERSON PJ, WERTHER GA, WARNE GL, ADLER RG, ANDREWES D. Neuropsychological complications of iddm in children 2 years after disease onset. *Diabetes Care* 1998; 21: 379–384.
15. HELGESON VS, SNYDER PR, ESCOBAR O, SIMINERIO L, BECKER D. Comparison of adolescents with and without diabetes on indices of psychosocial functioning for three years. *J Pediatr Psychol* 2007; 32: 794–806.
16. HELGESON VS, PALLADINO DK, REYNOLDS KA, BECKER DJ, ESCOBAR O, SIMINERIO L. Relationships and health among emerging adults with and without type 1 diabetes. *Health Psychol* 2014; in press.
17. NAAR-KING S, IDALSKI A, ELLIS D, et al. Gender differences in adherence and metabolic control in urban youth with poorly controlled type 1 diabetes: the mediating role of mental health symptoms. *J Pediatr Psychol* 2006; 31: 793–802.
18. HOLMES CS, CHEN R, STREISAND R, et al. Predictors of youth diabetes care behaviors and metabolic control: a structural equation modeling approach. *J Pediatr Psychol* 2006; 31: 770–784.
19. HOOD KK, HUESTIS S, MAHER A, BUTLER D, VOLKENING L, LAFFEL LMB. Depressive symptoms in children and adolescents with type 1 diabetes: association with diabetes-specific characteristics. *Diabetes Care* 2006; 29: 1389.
20. HERZER M, HOOD KK. Anxiety symptoms in adolescents with type 1 diabetes: association with blood glucose monitoring and glycemic control. *J Pediatr Psychol* 2010; 35: 415–425.

21. LAWRENCE JM, STANDIFORD DA, LOOTS B, et al. Prevalence and correlates of depressed mood among youth with diabetes: the SEARCH for diabetes in youth study. *Pediatrics* 2006; 117: 1348–1358.
22. KONGKAEW C, JAMPACHAISRI K, CHATURONGKUL CA, SCHOLFIELD CN. Depression and adherence to treatment in diabetic children and adolescents: a systematic review and meta-analysis of observational studies. *Eur J Pediatr* 2014; 173: 203–212.
23. HILLIARD ME, HERZER M, DOLAN LM, HOOD KK. Psychological screening in adolescents with type 1 diabetes predicts outcomes one year later. *Diabetes Res Clin Pract* 2011; 94: 39–44.
24. HILLIARD ME, WU YP, RAUSCH J, DOLAN LM, HOOD KK. Predictors of deteriorations in diabetes management and control in adolescents with type 1 diabetes. *J Adolesc Health* 2013; 52: 28–34.
25. LISS DS, WALLER DA, KENNARD BD, MCINTIRE D, CAPRA P, STEPHENS J. Psychiatric illness and family support in children and adolescents with diabetic ketoacidosis: a controlled study. *J Am Acad Child Adolesc Psychiatry* 1998; 37: 536–544.
26. ANDERSON BJ, MILLER JP, AUSLANDER WF, SANTIAGO JV. Family characteristics of diabetic adolescents: relationship to metabolic control. *Diabetes Care* 1981; 4: 586–594.
27. MALIK JA, KOOT HM. Explaining the adjustment of adolescents with type 1 diabetes: role of diabetes-specific and psychosocial factors. *Diabetes Care* 2009; 32: 774–779.
28. DELAMATER AM, PATIÑO-FERNANDEZ AM, SMITH KE, BUBB J. Measurement of diabetes stress in older children and adolescents with type 1 diabetes mellitus. *Pediatr Diabetes* 2013; 14: 50–56.
29. BRYDEN KS, PEVELER RC, STEIN A, NEIL A, MAYOU RA, DUNGER DB. Clinical and psychological course of diabetes from adolescence to young adulthood: a longitudinal cohort study. *Diabetes Care* 2001; 24: 1536–1540.
30. WYSOCKI T, HOUGH BS, WARD KM, GREEN LB. Diabetes mellitus in the transition to adulthood: adjustment, self-care, and health status. *J Dev Behav Pediatr* 1992; 13: 194–201.
31. COLTON PA, OLMSTED MP, DANEMAN D, RODIN GM. Depression, disturbed eating behavior, and metabolic control in teenage girls with type 1 diabetes. *Pediatr Diabetes* 2013; 14: 372–376.
32. BRYDEN KS, NEIL A, MAYOU RA, PEVELER RC, FAIRBURN CG, DUNGER DB. Eating habits, body weight, and insulin misuse. A longitudinal study of teenagers and young adults with type 1 diabetes. *Diabetes Care* 1999; 22: 1956–1960.
33. MELTZER LJ, BENNETT JOHNSON S, PRINE JM, BANKS RA, DESROSIERS PM, SILVERSTEIN JH. Disordered eating, body mass, and glycemic control in adolescents with type 1 diabetes. *Diabetes Care* 2001; 24: 678–682.
34. WISTING L, FRØISLAND DH, SKRIVARHAUG T, DAHL-JØRGENSEN K, RØ O. Disturbed eating behavior and omission of insulin in adolescents receiving intensified insulin treatment: a nationwide population-based study. *Diabetes Care* 2013; 36: 3382–3387.
35. RYDALL AC, RODIN GM, OLMSTED MP, DEVENYI RG, DANEMAN D. Disordered eating behavior and microvascular complications in young women with insulin-dependent diabetes mellitus. *N Engl J Med* 1997; 336: 1849–1854.
36. GOEBEL-FABBRI AE, FIKKAN J, FRANKO DL, PEARSON K, ANDERSON BJ, WEINGER K. Insulin restriction and associated morbidity and mortality in women with type 1 diabetes. *Diabetes Care* 2008; 31: 415–419.
37. YOUNG-HYMAN DL, DAVIS CL. Disordered eating behavior in individuals with diabetes importance of context, evaluation, and classification. *Diabetes Care* 2010; 33: 683–689.
38. HOLMES CS, RICHMAN LC. Cognitive profiles of children with insulin-dependent diabetes. *J Dev Behav Pediatr* 1985; 6: 323–326.
39. RYAN C, VEGA A, LONGSTREET C, DRASH A. Neuropsychological changes in adolescents with insulin-dependent diabetes. *J Consult Clin Psychol* 1984; 52: 335–342.
40. RYAN C, VEGA A, DRASH A. Cognitive deficits in adolescents who developed diabetes early in life. *Pediatrics* 1985; 75: 921–927.
41. ROVET JF, EHRLICH RM, HOPPE M. Specific intellectual deficits in children with early onset diabetes mellitus. *Child Dev* 1988; 59: 226–234.
42. ASVOLD BO, SAND T, HESTAD K, BJØRGAAS MR. Cognitive function in type 1 diabetic adults with early exposure to severe hypoglycemia: a 16-year follow-up study. *Diabetes Care* 2010; 33: 1945–1947.
43. PERANTIE DC, LIM A, WU J, et al. Effects of prior hypoglycemia and hyperglycemia on cognition in children with type 1 diabetes mellitus. *Pediatr Diabetes* 2008; 9: 87–95.
44. PATIÑO-FERNANDEZ AM, DELAMATER AM, APPLGATE EB, et al. Neurocognitive functioning in preschool-age children with type 1 diabetes mellitus. *Pediatr Diabetes* 2010; 11: 424–430.
45. HOLMES CS, DUNLAP WP, CHEN RS, CORNWELL JM. Gender differences in the learning status of diabetic children. *J Consult Clin Psychol* 1992; 60: 698–704.
46. SCHOENLE EJ, SCHOENLE D, MOLINARI L, LARGO RH. Impaired intellectual development in children with type 1 diabetes: association with HbA1c, age at diagnosis and sex. *Diabetologia* 2002; 45: 108–114.
47. MCCARTHY AM et al. Factors associated with academic achievement in children with type 1 diabetes. *Diabetes Care* 2003; 26: 112–117.
48. RYAN CM. Searching for the origin of brain dysfunction in diabetic children: going back to the beginning. *Pediatr Diabetes* 2008; 9: 527–530.
49. PARENT KB, WODRICH DL, HASAN KS. Type 1 diabetes mellitus and school: a comparison of patients and healthy siblings. *Pediatr Diabetes* 2009; 10: 554–562.
50. NORTHAM EA et al. Predictors of change in the neuropsychological profiles of children with type 1 diabetes 2 years after disease onset. *Diabetes Care* 1999; 22: 1438–1444.
51. LIN A et al. Neuropsychological profiles of young people with type 1 diabetes 12 yr after disease onset. *Pediatr Diabetes* 2010; 11: 235–243.
52. NAGUIB JM et al. Neuro-cognitive performance in children with type 1 diabetes – a meta-analysis. *J Pediatr Psychol* 2009; 34: 271–282.
53. GAUDIERI PA, CHEN R, GREER TF, HOLMES CS. Cognitive function in children with type 1 diabetes: a meta-analysis. *Diabetes Care* 2008; 31: 1892–1897.

54. JACQUEZ F, STOUT S, ALVAREZ-SALVAT R, et al. Parent perspectives of diabetes management in schools. *Diabetes Educ* 2008; 34: 996–1003.
55. WAGNER J, HEAPY A, JAMES A, ABBOTT G. Brief report: glycemic control, quality of life, and school experiences among students with diabetes. *J Pediatr Psychol* 2006; 31: 764–769.
56. TSIOLLI E, ALEXOPOULOS EC, STEFANAKI C, DARVIRI C, CHROUSOS GP. Effects of diabetes-related family stress on glycemic control in young patients with type 1 diabetes: systematic review. *Can Fam Physician* 2013; 59: 143–149.
57. MILLER-JOHNSON S, EMERY RE, MARVIN RS, CLARKE W, LOVINGER R, MARTIN M. Parent-child relationships and the management of insulin-dependent diabetes mellitus. *J Consult Clin Psychol* 1994; 62: 603–610.
58. LA GRECA AM, AUSLANDER WF, GRECO P, SPETTER D, FISHER JR. EB, SANTIAGO JV. I get by with a little help from my family and friends: adolescents' support for diabetes care. *J Pediatr Psychol* 1995; 20: 449–476.
59. ANDERSON B, HO J, BRACKETT J, FINKELSTEIN D, LAFFEL L. Parental involvement in diabetes management tasks: relationships to blood glucose monitoring adherence and metabolic control in young adolescents with insulin-dependent diabetes mellitus. *J Pediatr* 1997; 130: 257–265.
60. DAVIS CL, DELAMATER AM, SHAW KH, et al. Parenting styles, regimen adherence, and glycemic control in 4- to 10-year-old children with diabetes. *J Pediatr Psychol* 2001; 26: 123–129.
61. WYSOCKI T, IANNOTTI R, WEISSBERG-BENCHELL J, et al. Diabetes problem solving by youths with type 1 diabetes and their caregivers: measurement, validation, and longitudinal associations with glycemic control. *J Pediatr Psychol* 2008; 33: 875–884.
62. HELGESON VS, REYNOLDS KA, SIMINERIO L, ESCOBAR O, BECKER D. Parent and adolescent distribution of responsibility for diabetes self-care: links to health outcomes. *J Pediatr Psychol* 2008; 33: 497–508.
63. WYSOCKI T, NANSEL TR, HOLMBECK GN, et al. Collaborative involvement of primary and secondary caregivers: associations with youths' diabetes outcomes. *J Pediatr Psychol* 2009; 34: 869–81.
64. CAMERON FJ, SKINNER TC, DE BEAUFORT CE, et al. Are family factors universally related to metabolic outcomes in adolescents with type 1 diabetes? *Diabet Med* 2008; 25: 463–468.
65. HILLIARD ME, HOLMES CS, CHEN R, MAHER K, ROBINSON E, STREISAND R. Disentangling the roles of parental monitoring and family conflict in adolescents' management of type 1 diabetes. *Health Psychol* 2013; 32: 388–396.
66. SOOD ED, PENDLEY JS, DELAMATER AM, ROHAN JM, PULGARON ER, DROTAR D. Mother–father informant discrepancies regarding diabetes management: associations with diabetes-specific family conflict and glycemic control. *Health Psychol* 2012; 31: 571–579.
67. ROHAN JM, RAUSCH JR, PENDLEY JS, et al. Identification and prediction of group-based glycemic control trajectories during the transition to adolescence. *Health Psychol* 2014; in press.
68. SHORER M, DAVID R, SCHOENBERG-TAZ M, LEVAVI-LAVI I, PHILLIP M, MEYEROVITCH J. Role of parenting style in achieving metabolic control in adolescents with type 1 diabetes. *Diabetes Care* 2011; 34: 1735–1737.
69. BERG CA, SCHINDLER I, MAHARAJH S. Adolescents' and mothers' perceptions of the cognitive and relational functions of collaboration and adjustment in dealing with type 1 diabetes. *J Fam Psychol* 2008; 22: 865–874.
70. ORR DP, GOLDEN MP, MYERS G, MARRERO DG. Characteristics of adolescents with poorly controlled diabetes referred to a tertiary care center. *Diabetes Care* 1983; 6: 170–175.
71. WHITE K, KOLMAN ML, WEXLER P, POLIN G, WINTER RJ. Unstable diabetes and unstable families: a psychosocial evaluation of diabetic children with recurrent ketoacidosis. *Pediatrics* 1984; 73: 749–755.
72. FORSANDER GA, SUNDELIN J, PERSSON B. Influence of the initial management regimen and family social situation on glycemic control and medical care in children with type I diabetes mellitus. *Acta Paediatr* 2000; 89: 1462–1468.
73. OVERSTREET S, GOINS J, CHEN RS, et al. Family environment and the interrelation of family structure, child behavior, and metabolic control for children with diabetes. *J Pediatr Psychol* 1995; 20: 435–447.
74. THOMPSON SJ, AUSLANDER WF, WHITE NH. Comparison of single-mother and two-parent families on metabolic control of children with diabetes. *Diabetes Care* 2001; 24: 234–238.
75. AUSLANDER WF, THOMPSON S, DREITZER D, WHITE NH, SANTIAGO JV. Disparity in glycemic control and adherence between african-american and caucasian youths with diabetes: family and community contexts. *Diabetes Care* 1997; 20: 1569–1575.
76. DELAMATER AM, ALBRECHT DR, POSTELLON DC, GUTAI JP. Racial differences in metabolic control of children and adolescents with type i diabetes mellitus. *Diabetes Care* 1991; 14: 20–25.
77. DELAMATER AM, SHAW KH, APPLIGATE EB, et al. Risk for metabolic control problems in minority youth with diabetes. *Diabetes Care* 1999; 22: 700–705.
78. GALLEGOS-MACIAS AR, MACIAS SR, KAUFMAN E, SKIPPER B, KALISHMAN N. Relationship between glycemic control, ethnicity and socioeconomic status in Hispanic and white non-Hispanic youths with type 1 diabetes mellitus. *Pediatr Diabetes* 2003; 4: 19–23.
79. PETITTI DB, KLINGENSMITH GJ, BELL RA, et al. Glycemic control in youth with diabetes: the SEARCH for diabetes in youth study. *J Pediatr* 2009; 155: 668–672 e3.
80. REDONDO MJ, CONNOR CG, RUEDY KJ, et al. Pediatric diabetes consortium type 1 diabetes new onset (NeOn) study: factors associated with HbA1c levels one year after diagnosis. *Pediatr Diabetes* 2014; 15: 294–302.
81. CENGIZ E, XING D, WONG JC, et al. Severe hypoglycemia and diabetic ketoacidosis among youth with type 1 diabetes in the T1D Exchange clinic registry. *Pediatr Diabetes* 2013; 14: 447–454.
82. WHITTEMORE R, JASER S, CHAO A, JANG A, GREY M. Psychological experience of parents of children with type 1 diabetes: a systematic mixed-studies review. *Diabetes Educ* 2012; 38: 562–579.
83. KOVACS M, FINKELSTEIN R, FEINBERG TL, CROUSE-NOVAK M, PAULASKAS S, POLLOCK M. Initial psychologic responses of parents to the diagnosis of

- insulin dependent diabetes mellitus in their children. *Diabetes Care* 1985; 8: 568–575.
84. LANDOLT MA, RIBI K, LAIMBACHER J, VOLLRATH M, GNEHM HE, SENNHAUSER FH. Brief report: posttraumatic stress disorder in parents of children with newly diagnosed type 1 diabetes. *J Pediatr Psychol* 2002; 27: 647–652.
 85. FORSANDER G, PERSSON B, SUNDELIN J, BERGLUND E, SNELLMAN K, HELLSTROM R. Metabolic control in children with insulin-dependent diabetes mellitus 5y after diagnosis. Early detection of patients at risk for poor metabolic control. *Acta Pædiatrica* 1998; 87: 857–864.
 86. BARNARD K, THOMAS S, ROYLE P, NOYES K, WAUGH N. Fear of hypoglycaemia in parents of young children with type 1 diabetes: a systematic review. *BMC Pediatr* 2010; 10: 50.
 87. HAUGSTVEDT A, WENTZEL-LARSEN T, GRAUE M, SØVIK O, ROKNE B. 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. *Diabet Med* 2010; 27: 72–78.
 88. PETERS LW, NAWIJN L, VAN KESTEREN N. How adolescents with diabetes experience social support from friends: two qualitative studies. *Scientifica* 2014: 2014.
 89. MALIK JA, KOOT HM. Assessing diabetes support in adolescents: factor structure of the Modified Diabetes Social Support Questionnaire (M-DSSQ-Family). *Pediatr Diabetes* 2011; 12: 258–265.
 90. MALIK JA, KOOT HM. Assessing diabetes support in adolescents: factor structure of the modified Diabetes Social Support Questionnaire (DSSQ-Friends). *Diabet Med* 2012; 29: e232–e240.
 91. LA GRECA AM, BEARMAN KJ. The diabetes social support questionnaire-family version: evaluating adolescents' diabetes-specific support from family members. *J Pediatr Psychol* 2002; 27: 665–676.
 92. HAINS AA, BERLIN KS, DAVIES WH, SMOTHERS MK, SATO AF, ALEMZADEH R. Attributions of adolescents with type 1 diabetes related to performing diabetes care around friends and peers: the moderating role of friend support. *J Pediatr Psychol* 2007; 32: 561–570.
 93. HELGESON VS, SIMINERIO L, ESCOBAR O, BECKER D. Predictors of metabolic control among adolescents with diabetes: a 4-year longitudinal study. *J Pediatr Psychol* 2009; 34: 254–270.
 94. SULLIVAN-BOLYAI S, BOVA C, LEUNG K, TRUDEAU A, LEE M, GRUPPUSO P. Social support to empower parents (STEP): an intervention for parents of young children newly diagnosed with type 1 diabetes. *Diabetes Educ* 2010; 36: 88–97.
 95. CARCONE AI, ELLIS D, WEISZ A, NAAR-KING S. Social support for diabetes illness management: supporting adolescents and caregivers. *J Dev Behav Pediatr* 2011; 32: 581.
 96. HANSON SL, PICHERT JW. Perceived stress and diabetes control in adolescents. *Health Psychol* 1986; 5: 439–452.
 97. WORRALL-DAVIES A, HOLLAND P, BERG I, GOODYER I. The effect of adverse life events on glycaemic control in children with insulin dependent diabetes mellitus. *Eur Child Adolesc Psychiatry* 1999; 8: 11–16.
 98. HEMA DA, ROPER SO, NEHRING JW, CALL A, MANDLECO BL, DYCHES TT. Daily stressors and coping responses of children and adolescents with type 1 diabetes. *Child Care Health Dev* 2009; 35: 330–339.
 99. KUTTNER MJ, DELAMATER AM, SANTIAGO JV. Learned helplessness in diabetic youths. *J Pediatr Psychol* 1990; 15: 581–594.
 100. DELAMATER AM, KURTZ SM, BUBB J, WHITE NH, SANTIAGO JV. Stress and coping in relation to metabolic control of adolescents with type 1 diabetes. *J Dev Behav Pediatr* 1987; 8: 136–140.
 101. GROSSMAN HY, BRINK S, HAUSER ST. Self-efficacy in adolescent girls and boys with insulin-dependent diabetes mellitus. *Diabetes Care* 1987; 10: 324–329.
 102. GRAUE M, WENTZEL-LARSEN T, BRU E, HANESTAD BR, SØVIK O. The coping styles of adolescents with type 1 diabetes are associated with degree of metabolic control. *Diabetes Care* 2004; 27: 1313–1317.
 103. LUYCKX K, SEIFFGE-KRENKE I, HAMPSON SE. Glycemic control, coping, and internalizing and externalizing symptoms in adolescents with type 1 diabetes a cross-lagged longitudinal approach. *Diabetes Care* 2010; 33: 1424–1429.
 104. YI-FRAZIER JP, YAPTANGCO M, SEMANA S, et al. The association of personal resilience with stress, coping, and diabetes outcomes in adolescents with type 1 diabetes: Variable- and person-focused approaches. *J Health Psychol* 2014: in press.
 105. VAN BUSSEL A, NIEUWESTEEG A, JANSSEN E. Goal disturbance and coping in children with type I diabetes mellitus: relationships with health-related quality of life and A1C. *Can J Diabetes* 2013; 37: 169–174.
 106. SKOČIĆ M, RUDAN V, BRAJKOVIĆ L, MARČINKO D. Relationship among psychopathological dimensions, coping mechanisms, and glycemic control in a Croatian sample of adolescents with diabetes mellitus type 1. *Eur Child Adolesc Psychiatry* 2010; 19: 525–533.
 107. HANSON CL, CIGRANG JA, HARRIS MA, CARLE DL, RELYEA G, BURGHEEN GA. Coping styles in youths with insulin-dependent diabetes mellitus. *J Consult Clin Psychol* 1989; 57: 644–651.
 108. JASER S, WHITE L. Coping and resilience in adolescents with type 1 diabetes. *Child Care Health Dev* 2011; 37: 335–342.
 109. BOND GG, AIKEN LS, SOMERVILLE SC. The health belief model and adolescents with insulin-dependent diabetes mellitus. *Health Psychol* 1992; 11: 190–198.
 110. BROWNLEE-DUFFECK M, PETERSON L, SIMONDS JF, GOLDSTEIN D, KILO C, HOETTE S. The role of health beliefs in the regimen adherence and metabolic control of adolescents and adults with diabetes mellitus. *J Consult Clin Psychol* 1987; 55: 139–144.
 111. PALARDY N, GREENING L, OTT J, HOLDERBY A, ATCHISON J. Adolescents' health attitudes and adherence to treatment for insulin-dependent diabetes mellitus. *J Dev Behav Pediatr* 1998; 19: 31–37.
 112. SKINNER TC, HAMPSON SE. Personal models of diabetes in relation to self-care, well-being, and glycemic control: a prospective study in adolescence. *Diabetes Care* 2001; 24: 828–833.
 113. SKINNER TC, HAMPSON SE, FIFE-SCHAW C. Personality, personal model beliefs, and self-care in adolescents and young adults with type 1 diabetes. *Health Psychol* 2002; 21: 61–70.

114. PATINO AM, SANCHEZ J, EIDSON M, DELAMATER AM. Health beliefs and regimen adherence in minority adolescents with type 1 diabetes. *J Pediatr Psychol* 2005; 30: 503–512.
115. GREY M. Coping and psychosocial adjustment in mothers of young children with type 1 diabetes. *J Assoc Care Child Health* 2009; 38: 91–106.
116. GREY M, JASER S, WHITTEMORE R, JEON S, LINDEMANN E. Coping skills training for parents of children with type 1 diabetes: 12-month outcomes. *Nurs Res* 2011; 60: 173.
117. JASER SS, LINSKY R, GREY M. Coping and psychological distress in mothers of adolescents with type 1 diabetes. *Matern Child Health J* 2014; 18: 101–108.
118. PISULA E, CZAPLINSKA C. Coping with stress in adolescents with type 1 diabetes and their mothers. *Eur J Med Res* 2010; 15: 115–119.
119. STREISAND R, MACKAY ER, HERGE W. Associations of parent coping, stress, and well-being in mothers of children with diabetes: examination of data from a national sample. *Matern Child Health J* 2010; 14: 612–617.
120. KORNER A, WURZ J, BROSEAU DC, BRAHLER E, KAPELLEN T, KIESS W. Parental dyadic coping in families of children and adolescents with type 1 diabetes. *J Pediatr Endocrinol Metab* 2013; 26: 867–875.
121. NIEUWESTEEG A, POWWER F, VAN DER KAMP R, VAN BAKEL H, AANSTOOT HJ, HARTMAN E. Quality of life of children with type 1 diabetes: a systematic review. *Curr Diabetes Rev* 2012; 8: 434–443.
122. VARNI JW, BURWINKLE TM, JACOBS JR, GOTTSCHALK M, KAUFMAN F, JONES KL. The PedsQL™ in type 1 and type 2 diabetes: reliability and validity of the Pediatric Quality of Life Inventory™ generic core scales and type 1 diabetes module. *Diabetes Care* 2003; 26: 631–637.
123. UPTON P, EISER C, CHEUNG I, et al. Measurement properties of the UK-English version of the Pediatric Quality of Life Inventory™ 4.0 (PedsQL™) generic core scales. *Health Qual Life Outcomes* 2005; 3: 22.
124. HESKETH KD, WAKE MA, CAMERON FJ. Health-related quality of life and metabolic control in children with type 1 diabetes: a prospective cohort study. *Diabetes Care* 2004; 27: 415–420.
125. WAKE M, HESKETH K, CAMERON F. The Child Health Questionnaire in children with diabetes: cross-sectional survey of parent and adolescent-reported functional health status. *Diabet Med* 2000; 17: 700–707.
126. HASSAN K, LOAR R, ANDERSON BJ, HEPTULLA RA. The role of socioeconomic status, depression, quality of life, and glycemic control in type 1 diabetes mellitus. *J Pediatr* 2006; 149: 526–531.
127. FRØISLAND DH, GRAUE M, MARKESTAD T, SKRIVARHAUG T, WENTZEL-LARSEN T, DAHL-JØRGENSEN K. Health-related quality of life among Norwegian children and adolescents with type 1 diabetes on intensive insulin treatment: a population-based study. *Acta Paediatr* 2013; 102: 889–895.
128. HILLIARD ME, LAWRENCE JM, MODI AC, et al. Identification of minimal clinically important difference scores of the PedsQL in children, adolescents, and young adults with type 1 and type 2 diabetes. *Diabetes Care* 2013; 36: 1891–1897.
129. SAND P, KLJAJIĆ M, SCHALLER J, FORSANDER G. The reliability of the health related quality of life questionnaire PedsQL 3.0 Diabetes Module™ for Swedish children with type 1 diabetes. *Acta Paediatr* 2012; 101: e344–e349.
130. LAWRENCE JM, YI-FRAZIER JP, BLACK MH, et al. Demographic and clinical correlates of diabetes-related quality of life among youth with type 1 diabetes. *J Pediatr* 2012; 161: 201–207 e2.
131. LAFFEL LMB, CONNELL A, VANGSNES L, GOEBEL-FABBRI A, MANSFIELD A, ANDERSON BJ. General quality of life in youth with type 1 diabetes relationship to patient management and diabetes-specific family conflict. *Diabetes Care* 2003; 26: 3067–3073.
132. JOHNSON SR, COOPER MN, DAVIS EA, JONES TW. Hypoglycaemia, fear of hypoglycaemia and quality of life in children with type 1 diabetes and their parents. *Diabet Med* 2013; 30: 1126–1131.
133. GREY M, BOLAND EA, YU C, SULLIVAN-BOLYAI S, TAMBORLANE WV. Personal and family factors associated with quality of life in adolescents with diabetes. *Diabetes Care* 1998; 21: 909–914.
134. GUTTMANN-BAUMAN I, FLAHERTY BP, STRUGGER M, McEVOY RC. Metabolic control and quality-of-life self-assessment in adolescents with IDDM. *Diabetes Care* 1998; 21: 915–918.
135. HOEY H, AANSTOOT HJ, CHIARELLI F, et al. Good metabolic control is associated with better quality of life in 2,101 adolescents with type 1 diabetes. *Diabetes Care* 2001; 24: 1923–1928.
136. HILLIARD ME, MANN KA, PEUGH JL, HOOD KK. How poorer quality of life in adolescence predicts subsequent type 1 diabetes management and control. *Patient Educ Couns* 2013; 91: 120–125.
137. WAGNER VM, MÜLLER-GODEFFROY E, SENGBUSCH S, HÄGER S, THYEN U. Age, metabolic control and type of insulin regime influences health-related quality of life in children and adolescents with type 1 diabetes mellitus. *Eur J Pediatr* 2005; 164: 491–496.
138. VALENZUELA JM, PATINO AM, MCCULLOUGH J, et al. Insulin pump therapy and health-related quality of life in children and adolescents with type 1 diabetes. *J Pediatr Psychol* 2006; 31: 650–660.
139. Juvenile Diabetes Research Foundation Continuous Glucose Monitoring Study Group, BECK RW, LAWRENCE JM, et al. Quality-of-life measures in children and adults with type 1 diabetes: juvenile diabetes research foundation continuous glucose monitoring randomized trial. *Diabetes Care* 2010; 33: 2175–2177.
140. HAMPSON SE, SKINNER TC, HART J, et al. Effects of educational and psychosocial interventions for adolescents with diabetes mellitus: a systematic review. *Health Technol Assess* 2001; 5: 1–79.
141. MURPHY HR, RAYMAN G, SKINNER TC. Psycho-educational interventions for children and young people with type 1 diabetes. *Diabet Med* 2006; 23: 935–43.
142. DELAMATER AM, JACOBSON AM, ANDERSON B, et al. Psychosocial therapies in diabetes: report of the psychosocial therapies working group. *Diabetes Care* 2001; 24: 1286–1292.
143. ANDERSON BJ, BRACKETT J, HO J, LAFFEL LM. An office-based intervention to maintain parent-adolescent teamwork in diabetes management. Impact on parent involvement, family conflict, and subsequent glycemic control. *Diabetes Care* 1999; 22: 713–721.

144. WYSOCKI T, MILLER KM, GRECO P, et al. Behavior therapy for families of adolescents with diabetes: Effects on directly observed family interactions. *Behav Ther* 1999; 30: 507–525.
145. WYSOCKI T, HARRIS MA, GRECO P, et al. Randomized, controlled trial of behavior therapy for families of adolescents with insulin-dependent diabetes mellitus. *J Pediatr Psychol* 2000; 25: 23–33.
146. WYSOCKI T, GRECO P, HARRIS MA, BUBB J, WHITE NH. Behavior therapy for families of adolescents with diabetes: maintenance of treatment effects. *Diabetes Care* 2001; 24: 441–446.
147. WYSOCKI T, HARRIS MA, BUCKLOH LM, et al. Effects of behavioral family systems therapy for diabetes on adolescents' family relationships, treatment adherence, and metabolic control. *J Pediatr Psychol* 2006; 31: 928–938.
148. WYSOCKI T, HARRIS MA, BUCKLOH LM, et al. Randomized trial of behavioral family systems therapy for diabetes: maintenance of effects on diabetes outcomes in adolescents. *Diabetes Care* 2007; 30: 555–560.
149. WYSOCKI T, HARRIS MA, BUCKLOH LM, et al. Randomized, controlled trial of behavioral family systems therapy for diabetes: maintenance and generalization of effects on parent-adolescent communication. *Behav Ther* 2008; 39: 33–46.
150. LARON Z, GALATZER A, AMIR S, GIL R, KARP M, MIMOUNI M. A multidisciplinary, comprehensive, ambulatory treatment scheme for diabetes mellitus in children. *Diabetes Care* 1979; 2: 342–348.
151. GALATZER A, AMIR S, GIL R, KARP M, LARON Z. Crisis intervention program in newly diagnosed diabetic children. *Diabetes Care* 1982; 5: 414–419.
152. DELAMATER AM, BUBB J, DAVIS SG, et al. Randomized prospective study of self-management training with newly diagnosed diabetic children. *Diabetes Care* 1990; 13: 492–498.
153. SUNDELIN J, FORSANDER G, MATTSON SE. Family-oriented support at the onset of diabetes mellitus: a comparison of two group conditions during 2 years following diagnosis. *Acta Paediatr* 1996; 85: 49–55.
154. SULLIVAN BOLYAI S, GREY M, DEATRICK J, GRUPPUSO P, GIRAITIS P, TAMBORLANE W. Helping other mothers effectively work at raising young children with type 1 diabetes. *Diabetes Educ* 2004; 30: 476–84.
155. WYSOCKI T, TAYLOR A, HOUGH BS, LINSCHIED TR, YEATES KO, NAGUERI JA. Deviation from developmentally appropriate self-care autonomy: association with diabetes outcomes. *Diabetes Care* 1996; 19: 119–125.
156. LAFFEL LMB, VANGSNESS L, CONNELL A, GOEBEL-FABBRI A, BUTLER D, ANDERSON B. Impact of ambulatory, family-focused teamwork intervention on glycemic control in youth with type 1 diabetes. *J Pediatr* 2003; 142: 409–416.
157. SVOREN BM, BULTER B, LEVINE B-S, ANDERSON BJ, LAFFEL LMB. Reducing acute adverse outcomes in youths with type 1 diabetes: a randomized. Control Trial *J Pediatr* 2003; 112: 914–922.
158. HARRIS MA, MERTLICH D. Piloting home-based behavioral family systems therapy for adolescents with poorly controlled diabetes. *Child Health Care* 2003; 32: 65–79.
159. ELLIS DA, FREY MA, NAAR-KING S, TEMPLIN T, CUNNINGHAM PB, CAKAN N. Use of Multisystemic therapy to improve regimen adherence among adolescents with type 1 diabetes in chronic poor metabolic control: a randomized controlled trial. *Diabetes Care* 2005; 28: 1604–1610.
160. ELLIS DA, NAAR-KING S, FREY M, TEMPLIN T, ROWLAND M, CAKAN N. Multisystemic treatment of poorly controlled type 1 diabetes: effects on medical resource utilization. *J Pediatr Psychol* 2005; 30: 656–666.
161. ELLIS DA, NAAR-KING S, TEMPLIN T, et al. Multisystemic therapy for adolescents with poorly controlled type 1 diabetes: reduced diabetic ketoacidosis admissions and related costs over 24 months. *Diabetes Care* 2008; 31: 1746–1747.
162. ANDERSON BJ, WOLF FM, BURKHART MT, CORNELL RG, BACON GE. Effects of peer-group intervention on metabolic control of adolescents with iddm: randomized outpatient study. *Diabetes Care* 1989; 12: 179–183.
163. BOLAND EA, GREY M, OESTERLE A, FREDRICKSON L, TAMBORLANE WV. Continuous subcutaneous insulin infusion. A new way to lower risk of severe hypoglycemia, improve metabolic control, and enhance coping in adolescents with type 1 diabetes. *Diabetes Care* 1999; 22: 1779–1784.
164. GREY M, BOLAND EA, DAVIDSON M, YU C, SULLIVAN-BOLYAI S, TAMBORLANE WV. Short-term effects of coping skills training as adjunct to intensive therapy in adolescents. *Diabetes Care* 1998; 21: 902–908.
165. GREY M, BOLAND EA, DAVIDSON M, LI J, TAMBORLANE WV. Coping skills training for youth with diabetes mellitus has long-lasting effects on metabolic control and quality of life. *J Pediatr* 2000; 137: 107–113.
166. BOARDWAY RH, DELAMATER AM, TOMAKOWSKY J, GUTAI J. Stress management training for adolescents with diabetes. *J Pediatr Psychol* 1993; 18: 29–45.
167. HAINS AA, DAVIES W, PARTON E, TOTKA J, AMOROSO-CAMARATA J. A stress management intervention for adolescents with type i diabetes. *Diabetes Educ* 2000; 26: 417–424.
168. MÉNDEZ FJ, BELÉNDEZ M. Effects of a behavioral intervention on treatment adherence and stress management in adolescents with IDDM. *Diabetes Care* 1997; 20: 1370–1375.
169. COOK S, HEROLD K, EDIDIN DV, BRIARS R. Increasing problem solving in adolescents with type 1 diabetes: the choices diabetes program. *Diabetes Educ* 2002; 28: 115–124.
170. JACOBSON AM, HAUSER ST, WILLET J, WOLFSORF JI, HERMAN L. Consequences of irregular versus continuous medical follow-up in children and adolescents with insulin-dependent diabetes mellitus. *J Pediatr* 1997; 131: 727–733.
171. KAUFMAN FR, HALVORSON M, CARPENTER S. Association between diabetes control and visits to a multidisciplinary pediatric diabetes clinic. *Pediatrics* 1999; 103: 948–951.
172. JOHNSON SB, KELLY M, HENRETTA JC, CUNNINGHAM WR, TOMER A, SILVERSTEIN JA. A longitudinal analysis of adherence and health status in childhood diabetes. *J Pediatr Psychol* 1992; 17: 537–553.

173. VINER RM, CHRISTIE D, TAYLOR V, HEY S. Motivational/solution-focused intervention improves HbA1c in adolescents with type 1 diabetes: a pilot study. *Diabet Med* 2003; 20: 739–742.
174. CHANNON S, SMITH VJ, GREGORY JW. A pilot study of motivational interviewing in adolescents with diabetes. *Arch Dis Child* 2003; 88: 680–683.
175. CHANNON SJ, HUWS-THOMAS M, ROLLNICK S, et al. A multicenter randomized controlled trial of motivational interviewing in teenagers with diabetes. *Diabetes Care* 2007; 30: 1390–1395.
176. NANSEL TR, IANNOTTI RJ, SIMONS-MORTON BG, et al. Diabetes personal trainer outcomes: short-term and 1-year outcomes of a diabetes personal trainer intervention among youth with type 1 diabetes. *Diabetes Care* 2007; 30: 2471–7.
177. NANSEL TR, IANNOTTI RJ, SIMONS-MORTON BG, PLOTNICH LP, CLARK LM, ZEITZOFF L. Long-term maintenance of treatment outcomes: diabetes personal trainer intervention for youth with type 1 diabetes. *Diabetes Care* 2009; 32: 807–809.
178. AMBROSINO JM, FENNIE K, WHITTEMORE R, JASER S, DOWD MF, GREY M. Short-term effects of coping skills training in school-age children with type 1 diabetes. *Pediatr Diabetes* 2008; 9: 74–82.
179. GREY M, WHITTEMORE R, JASER S, et al. Effects of coping skills training in school-age children with type 1 diabetes. *Res Nurs Health* 2009; 32: 405–418.
180. DE WIT M, DELEMARRE-VAN DE WAAL HA, POUWER F, GEMKE RBB, SNOEK FJ. Monitoring and discussing health-related quality of life in adolescents with type 1 diabetes improve psychosocial well-being: a randomized controlled trial. *Diabetes Care* 2008; 31: 1521–1526.
181. MURPHY HR, WADHAM C, RAYMAN G, SKINNER TC. Approaches to integrating paediatric diabetes care and structured education: experiences from the Families, Adolescents, and Children’s Teamwork Study (FACTS). *Diabet Med* 2007; 24: 1261–1268.
182. NANSEL TR, ANDERSON BJ, LAFFEL LMB, et al. A multisite trial of a clinic-integrated intervention for promoting family management of pediatric type 1 diabetes: feasibility and design. *Pediatr Diabetes* 2009; 10: 105–115.
183. NANSEL TR, IANNOTTI RJ, LIU A. Clinic-integrated behavioral intervention for families of youth with type 1 diabetes: randomized clinical trial. *Pediatrics* 2012; 129: e866–e873.
184. MULVANEY SA, ROTHMAN RL, WALLSTON KA, LYBARGER C, DIETRICH MS. An internet-based program to improve self-management in adolescents with type 1 diabetes. *Diabetes Care* 2010; 33: 602–604.
185. MULVANEY SA, ROTHMAN RL, OSBORN CY, LYBARGER C, DIETRICH S, WALLSTON KA. Self-management problem solving for adolescents with type 1 diabetes: Intervention processes associated with an Internet program. *Patient Educ Couns* 2011; 85: 140–142.
186. GREY M, WHITTEMORE R, JEON S, MURPHY K, FAULKNER MS, DELAMATER A. Internet psycho-education programs improve outcomes in for youth with type 1 diabetes. *Diabetes Care* 2013; 36: 2475–2482.
187. HOOD KK, ROHAN JM, PETERSON CM, DROTAR D. Interventions with adherence-promoting components in pediatric type 1 diabetes: meta-analysis of their impact on glycemic control. *Diabetes Care* 2010; 33: 1658–1664.
188. MCBROOM LA, ENRIQUEZ M. Review of family-centered interventions to enhance the health outcomes of children with type 1 diabetes. *Diabetes Educ* 2009; 35: 428–438.