Psychosocial Care for Youth with Type 1 Diabetes

Summary of Reviews to Inform Clinical Practice

Jenna B. Shapiro, PhD[a,b,*], Kimberly P. Garza, PhD, MPH[c], Marissa A. Feldman, PhD[d], Madeleine C. Suhs, BS[a], Julia Ellis, BS[a], Amanda Terry, PhD[a,b], Kelsey R. Howard, PhD[a,b], Jill Weissberg-Benchell, PhD, CDCES[a,b]

KEYWORDS

• Type 1 diabetes • Children • Adolescents • Psychosocial • Intervention

KEY POINTS

- Psychosocial interventions in pediatric type 1 diabetes address barriers to diabetes care and enhance strengths to optimize self-management behaviors and improve emotional well-being.
- Family-based interventions demonstrate the most robust impact across glycemic and psychosocial outcomes. Youth-focused cognitive behavioral theory and motivational interviewing approaches also demonstrate positive effects.
- The most common intervention components include a formal approach to problem-solving and communication skills for healthy discussion and reduced family conflict.
- Interventions to improve health equity, caregiver well-being, and barriers to diabetes technology use show promising preliminary outcomes.

INTRODUCTION

The American Diabetes Association (ADA)[1,2] and the International Society for Pediatric and Adolescent Diabetes (ISPAD)[3] provide psychosocial care recommendations for youth with type 1 diabetes (T1D). Standards of care recognize that the daily demands of diabetes can negatively affect mental health. In addition, mental health, family dynamics, and the broader context in which a family lives impact self-management

[a] Ann & Robert H. Lurie Children's Hospital of Chicago, Pritzker Department of Psychiatry and Behavioral Health, 225 East Chicago Avenue, Box 10, Chicago, IL 60611, USA; [b] Northwestern University Feinberg School of Medicine, Department of Psychiatry & Behavioral Sciences, 446 E Ontario Street, Chicago, IL, USA; [c] Roanoke College, 221 College Lane, Salem, VA 24153, USA; [d] Johns Hopkins All Children's Hospital, Child Development and Rehabilitation Center, 880 Sixth Street South #170, Saint Petersburg, FL 33701, USA
* Corresponding author.
E-mail address: jeshapiro@luriechildrens.org

Endocrinol Metab Clin N Am ■ (2023) ■–■
https://doi.org/10.1016/j.ecl.2023.10.002 **endo.theclinics.com**

behaviors and glycemic outcomes.[1] Guidelines support creating a psychosocially-minded multidisciplinary team that offers routine psychological assessment and ongoing support beyond merely offering services when problems are identified.[1,3]

ADA and ISPAD both recommend administration of age-appropriate psychosocial screening tools (patient-reported outcomes) at diagnosis, in periodic intervals (eg, annually), when there are diabetes difficulties, and during life transitions.[1–4] Although generic measures of mental health are important to evaluate (eg, depression, anxiety, psychiatric history), diabetes-specific factors that affect self-management should also be assessed for youth and their caregivers.[1,3] Diabetes-related screening may include attitudes related to diabetes, expectations about and barriers to diabetes management, the emotional impact of diabetes (eg, diabetes distress, fear of hypoglycemia [FOH], health-related quality of life [HRQOL]), and family dynamics (eg, family communication and conflict, family involvement in diabetes tasks).[1–4] Screeners also assess for disordered eating behaviors and intentional insulin omission for weight loss, diabetes-related strengths, cognitive assessment and school functioning, sleep problems, health literacy, and access to resources.[1–4] Validated measures are often available for self-report by youth starting around age 8 years and for caregiver report.[3] Parent-proxy report is also available for screening emotional and behavioral challenges in younger children.[3]

When indicated, evidence-based behavioral health interventions address barriers to optimal self-care behaviors and build skills for enhanced diabetes and psychological outcomes.[1,3–5] ISPAD also encourages proactive interventions to prevent distress and optimize diabetes management.[3] The current review summarizes findings from select systematic reviews and meta-analyses on psychosocial interventions in pediatric diabetes to inform recommendations for care (**Table 1**, for a list of included reviews). Evidence-based interventions are organized around key behavioral health targets, including (1) emotional impact of diabetes and coping skills for youth with T1D, (2) family dynamics and caregiver mental health, (3) systemic factors contributing to health disparities, and (4) psychosocial factors affecting diabetes technology uptake and use.

YOUTH-FOCUSED BEHAVIORAL HEALTH INTERVENTIONS

Psychosocial Factors Impacting Youth Diabetes Outcomes

The time-intensive, complex, and relentless nature of diabetes self-management can impact youth mental health. Diabetes-specific distress refers to the negative emotions people experience (eg, worry, guilt, anger) when living with diabetes and the burden of daily self-management.[6] Diabetes-specific distress is recommended to be routinely monitored in youth ages 7 or 8 years and up and caregivers due to its high prevalence and negative impact on self-management and glycemic outcomes.[1,2] FOH can lead to purposefully maintaining suboptimally higher glucose levels to prevent hypoglycemia.[7] HRQOL, and diabetes HRQOL specifically, refers to an individual's subjective experience of the impact that diabetes and its management have on daily functioning.[8]

The diabetes resilience model[9] recognizes the challenges of managing diabetes and posits that protective processes are used to achieve optimal health and emotional outcomes. Protective processes include goal setting, problem-solving, stress management, and the ability to make meaning out of adverse experiences.[9] Diabetes strengths refer to adaptive skills including the perceived ability to manage the demands of diabetes and rely on others for help when needed.[10]

Although diabetes-specific distress and FOH are associated with suboptimal self-care behaviors and glycemic outcomes,[6,7] higher levels of diabetes-specific HRQOL

Table 1
Summary of select reviews on psychosocial interventions in pediatric diabetes

Reference, Date	Summary of Focus Area
Barry-Menkhaus et al,[24] 2020	Review of brief strategies for distress and self-management that can be delivered alongside usual medical care
Bergmame & Shaw,[11] 2021	Systematic and scoping review of psychosocial interventions to improve diabetes management
Boland et al,[37] 2019	Systematic review of barriers and facilitators to shared decision-making in pediatric health care settings
Butler et al,[57] 2022	Review of health disparities and promising approaches to improve health equity
Ellis & Naar,[25] 2023	Review of interventions to improve health disparities for racial and ethnic minoritized youth
Feldman et al,[32] 2018	Systematic review of family-based interventions
Fitzpatrick et al,[12] 2013	Systematic review of problem-solving interventions for diabetes self-management and glycemic outcomes
Gayes & Steele,[23] 2014	Meta-analysis of motivational interviewing for pediatric health behavior change
Hilliard et al,[13] 2016	Review of behavioral interventions to promote diabetes management
Hood et al,[14] 2010	Systematic review and meta-analysis of interventions with adherence-promoting components on glycemic control
Ispriantari et al,[34] 2023	Systematic review of family-based interventions on health outcomes
Lohan et al,[43] 2015	Systematic review of parenting interventions
McBroom & Enriquez,[33] 2009	Systematic review of family-based interventions on health outcomes and family dynamics
Savage et al,[18] 2010	Systematic review of psychosocial interventions on health outcomes
Tully et al,[44] 2017	Review of peer coaching interventions for caregivers
Wagner et al,[61] 2019	Review of interventions addressing diabetes-related challenges organized by social ecological systems
Winkley et al,[17] 2006	Systematic review and meta-analysis of psychological interventions on glycemic outcomes for children and adults
Winkley et al,[15] 2020	Systematic review and meta-analysis of psychological interventions on glycemic outcomes for children and adults
Wu et al,[16] 2023	Systematic review and meta-analysis of resilience-promoting interventions in adolescents
Zhao et al,[45] 2019	Meta-analysis of parenting interventions on psychosocial adjustment in caregivers of youth

and diabetes strengths are associated with more optimal self-care behaviors and glycemic outcomes.[8,10] By identifying an individual's strengths and struggles related to diabetes, effective behavioral health programs can be provided that build skills and target areas of concern. Diabetes-specific interventions differ from general approaches for mental health difficulties that do not address challenges directly related to diabetes.

Interventions for Children and Adolescents

Several published reviews evaluate the impact of youth-focused psychosocial interventions for diabetes-specific challenges.[11–16] Some reviews and meta-analyses

combine different youth-focused and family-based interventions and have mixed findings. Some show small effects on glycemic outcomes,[14,17] others show no treatment effect,[15] and some show mixed effects for glycemic, self-management, and psychosocial outcomes.[11,12,16] Results suggest that theory-based interventions contribute to more positive health outcomes than a-theoretical interventions.[18]

Of the promising youth-focused behavioral health interventions, many are based on social cognitive theory (SCT), cognitive behavioral theory (CBT), or motivational interviewing (MI).[11,13] SCT suggests that an individual's belief in their ability to engage in diabetes self-care behaviors and the anticipated positive or negative consequences of each behavior influence the likelihood of completing self-management behaviors.[19] CBT recognizes interrelationships between thoughts, emotions, and behaviors. Negative thoughts are modified about diabetes and other situations, and adaptive coping behaviors are increased (eg, problem-solving, relaxation, assertive communication, organizational skills) to improve self-management behaviors and emotional well-being. MI recognizes that individuals vary in their readiness and willingness to change and that the likelihood of change, such as engaging in new or more frequent diabetes self-management behaviors, is enhanced when individuals articulate their own self-motivating change-focused statements.[20]

Resilience promotion interventions, or positive psychology interventions, use CBT and SCT to promote positive health and psychosocial outcomes.[13,16] Although resilience promotion interventions often teach more than one skill, the common thread is problem-solving, including identifying the problem, evaluating possible solutions, selecting the best option, and assessing impact.[12,16] Coping skills training is one group-based resilience promotion intervention that teaches problem-solving, stress management, assertive communication skills, positive self-talk, and conflict resolution and is associated with improved glycemic outcomes and HRQOL for teenagers 1-year post-intervention.[21] Supporting Teen Problem-Solving (STePS) is another teen-focused group-based intervention that builds diabetes strengths by improving emotion regulation, perspective-taking, problem-solving, and communication.[22] STePS reduces diabetes distress and depressive symptoms with effects increasing over 3 years.[22]

MI is a patient-centered empathy-led communication approach that increases the likelihood of behavior change by understanding the barriers to change and enhancing a youth's intrinsic motivation.[20] MI involves building awareness of discrepancies between current and desired behaviors, selectively reflecting youths' statements about reasons and ability to change, and setting and achieving attainable goals. MI is associated with improvements in hemoglobin A1c (HbA1c) and diabetes self-management behaviors for adolescents in the short and long term.[23]

Some reviews highlight the importance of mobile health approaches for teenagers given their relevance and potential for dissemination.[13] Technology-based interventions include reminders or positive affirmations via text message, apps for self-management monitoring, and reward-based gamified programs for self-management behaviors.[13] Although electronic interventions show some promise for self-efficacy and self-management behaviors, findings are mixed and youth-focused interventions do not appear to improve glycemic outcomes.[13,24,25]

Another review described brief interventions, referring to single session or low time commitment approaches that are potentially scalable in clinic settings and for families with low resources who may have limited availability to attend multiple sessions.[24] Examples include a resilience-based intervention, as part of the Diabetes Strengths Study that trained providers to emphasize what the youth is doing well and praise self-care behaviors, finding a positive impact on diabetes strengths, self-management behaviors,

and diabetes distress.[26] In addition, MI can be delivered by any provider in a clinic setting by understanding what is important to a youth, focusing on the benefit of engaging in specific self-management behaviors to improve personal priority areas in the short term, and encouraging self-articulated reasons for change, though mental health professionals may be able to garner more robust effects. Other brief strategies include recommendations to pair diabetes tasks with other specific routine activities and teaching components of interventions that would typically be delivered over multiple sessions (eg, role playing to practice telling peers about diabetes; problem-solving to address a diabetes-related stressor; encouraging youth "delegation" of tasks to others increase tangible support).[24]

FAMILY-BASED BEHAVIORAL HEALTH INTERVENTIONS

Role of Parenting and Family Factors on Diabetes Outcomes

T1D impacts the entire family. When children are young, caregivers are directly responsible for diabetes management.[27] Young children may have difficulty communicating symptoms, engage in inconsistent food intake and physical activity, and may have difficulty tolerating finger sticks, insulin injections, or technology insertion.[27] Parenting behaviors around diabetes tasks and mealtime, and caregiver coping and psychological adjustment, affect diabetes management.[27] Diabetes distress and FOH are common for caregivers and affect glycemic outcomes, the latter increasing risk for intentionally maintaining higher glucose levels.[27]

Family involvement ideally becomes more collaborative in nature with as youth age. Open communication, shared responsibility for diabetes tasks, and emotional support from caregivers can enable self-efficacy (eg, parents' transition from administration of tasks to monitoring).[28] Authoritative parenting, family cohesion, and positive communication are associated with better child adjustment, psychological functioning, and glycemic outcomes.[29,30] Conversely, authoritarian parenting, high levels of diabetes-related family conflict, and diabetes-specific distress in caregivers are related to decreased adherence and worse glycemic outcomes.[31] Premature transition to independence in self-care, especially as competing demands increase during adolescence, can worsen self-management and glycemic control.[29] "Miscarried helping," an overinvolved and intrusive parenting behavior that is negatively perceived by adolescents, can also result in less engagement in self-care tasks, suboptimal glycemia, and negative psychological outcomes.[28]

Family-Focused Interventions

Several reviews evaluate family-based interventions, which broadly improve HbA1c, self-management behaviors, family functioning, and HRQOL.[32–34] Behavioral Family Systems Therapy (BFST) improves maladaptive family interactions and rules, changes negative assumptions about other family members' behaviors, and enhances collaborative problem-solving and communication skills (eg, reducing blame and lecturing through practicing non-accusatory statements, praise, and reflective listening).[35] With positive outcomes on diabetes-related family conflict, self-management behaviors, and parent–child relationships, revisions were made to include content specific to diabetes. The revised intervention, BFST for Diabetes (BFST-D), included behavioral contracting in which attainable goals and the behavioral steps to achieve them were identified along with associated privileges and consequences. Modifications resulted in improved self-management behaviors and HbA1c.[36]

Within the clinic setting, shared decision-making reflects a general approach to collaborating with patients and families in goal setting and other aspects of care by centering

youth and caregiver preferences and values.[24,37] Another in-clinic intervention, Family Teamwork, involves four visits during diabetes appointments in which psychoeducation is provided on diabetes in the context of child development (eg, explaining the many factors affecting blood glucose and the need for active parental involvement).[38,39] An individualized responsibility sharing plan delineates caregiver versus youth task responsibilities. Collaborative problem-solving, emotional support, and communication with calm and neutral language are encouraged for out-of-range numbers, meals, and exercise. Family Teamwork improves family conflict, parent involvement, and HbA1c.[38,39]

Multifamily group therapy provides support to youth and their parents in a group setting and incorporates approaches such as behavioral contracting,[40] problem-solving,[40,41] communication skills,[40,41] and parent simulation of living with diabetes.[42] Multifamily groups improve glycemic outcomes under certain circumstances[41,42] and enhance psychosocial outcomes (eg, responsibility sharing, HRQOL).[40]

Caregiver-Only Interventions

Many family-based interventions include the youth with T1D, but some reviews focus on caregiver-only interventions.[43–46] One review evaluated peer coaching in which trained caregivers of youth with T1D provided emotional support and practical guidance on daily tasks.[44] Mothers receiving peer coaching experienced less diabetes distress, fewer management concerns, and more self-confidence.[47] However, follow-up studies resulted in inconsistent findings.[48,49] A stepped care approach, in which peer coaching was augmented by telephone-based CBT skills and then consultation with a diabetes educator and psychologist if needed (First STEPS [Study of Type 1 in Early childhood and Parenting Support]), found significant improvements in parent depressive symptoms over time.[46,50]

A few studies have focused on teaching CBT skills to support caregiver mental health and diabetes management. The Reducing Emotional Distress for Childhood Hypoglycemia in Parents (REDCHiP) intervention taught caregivers to identify worried thoughts related to hypoglycemia, enhance coping strategies (eg, relaxation, positive self-talk) and develop a fear hierarchy to engage in or imagine hypoglycemia-related situations (eg, having another adult treat a low). REDCHiP improved caregiver FOH at post-intervention and 3-month follow-up.[51] A telephone-based parent support program also taught CBT skills including problem-solving, resulting in improved short-term parenting stress.[52]

Parenting training enhances positive parenting strategies to improve behavioral functioning in youth. The standardized Positive Parenting Program (Triple P) was conducted with parents of young children with T1D and teaches parent behavior management skills to increase positive behaviors (eg, praise, quality time, giving instructions) and reduce misbehavior (eg, planned ignoring, setting ground rules, consequences, time out). Triple P improved caregiver depressive symptoms, anxiety, diabetes-related family conflict, and child disruptive behaviors for youth with preexisting challenges in the short term.[53] The DELFIN (Das Elterntraining für Eltern von Kindern mit Diabetes Typ 1 [The parenting program for parents of children with type 1 diabetes]) caregiver group intervention taught communication skills for diabetes-specific conflict situations. Metabolic outcomes remained stable for the intervention group while the control group declined.[54]

HEALTH EQUITY INTERVENTIONS

Health and Mental Health Disparities in Pediatric Type 1 Diabetes

Health equity is a fundamental goal in pediatric diabetes that refers to the absence of unfair differences in health across groups of people.[55] Health disparities occur in the

context of systemic unfair distribution of resources and opportunities, historical disinvestment, hierarchical social structures, and discriminatory laws and policies that continue to enact harm on specific communities and result in systematic differences in health. Disparities in diabetes are well-documented; racially and ethnically minoritized youth with T1D experience worse health and psychosocial outcomes, including higher HbA1c levels, diabetes-related complications, less access to diabetes technologies, more difficulty engaging in diabetes care, higher diabetes distress, and lower social support than non-Hispanic White youth.[56,57] Youth and families with lower socioeconomic resources also experience higher HbA1c levels, more hospital admissions, and diabetes distress, and fewer opportunities to meet peers with diabetes.[57–59]

Social determinants of health are the circumstances in which people live, work, and grow and have been identified as important intervention targets to improve disparities in health.[55] Examples include difficulty accessing a treatment provider due to living far away from a medical setting, lack of access to affordable transportation, food and housing instability, financial difficulty, and exposure to chronic stress directly and indirectly impacting glycemic control and psychosocial outcomes.[25,55,57] A recent study found that implicit bias in medical providers reduces diabetes technology access such that families with public insurance are less likely to be offered technology, a practice that disproportionately affects racially and ethnically minoritized youth.[60] Mental health care stigma, low access to diabetes-related psychosocial support, and lack of experienced and diverse mental health providers are barriers to care that also disproportionately affect minoritized populations.[57]

Behavioral Health Interventions to Improve Health Equity

In addition to policy-related advocacy, culturally informed behavioral health interventions and those designed to improve access to equitable health care are critical for improving health and mental health equity.[25,57,61] Culturally sensitive intervention adaptations for racially and ethnically minoritized families include sharing short stories about other families' experiences to destigmatize challenges, using culturally tailored materials, offering culturally relevant faith-based coping strategies, and creating language-congruent clinics for Spanish-speaking families.[25,57,62] One three-session clinic-administered e-health intervention to increase caregiver monitoring for Black teenagers, The 3Ms (standing for *medicine*, *meter*, and *meals*), was developed with community partners, showing positive effects on HbA1c.[63]

To improve social determinants of health, Care Ambassadors increase clinic attendance by focusing on scheduling/rescheduling and confirming appointments.[64] In-person service navigators who provide community referrals to address social needs positively impact child health in other pediatric settings, with research in diabetes underway.[57,65] Providers can also be educated about insurance coverage for technology and risk for implicit bias to reduce gatekeeping devices.[25,60,66]

For families with frequent diabetes care difficulties, Multisystemic Therapy (MST) for diabetes involves intensive, home-based, individualized support to improve factors affecting diabetes in family, peer, school, neighborhood/community, and medical care settings.[67] At the youth and family levels, MST may incorporate CBT, parenting training, problem-solving, and communication skills. Within school, peer, and community settings, diabetes support and monitoring are increased. In the medical setting, clinic attendance barriers are addressed and family medical team communication and collaboration is facilitated. MST reduces diabetes-specific distress, HbA1c, and hospital admissions[67] and has been adapted with preliminary positive findings to be delivered by community health workers.[68]

Novel Interventions in Children's Healthcare (NICH) is a multisystemic intervention focused on improving social determinants of health and diabetes management within the broader environmental context.[69] NICH involves 24/7 care coordination and case management with frequent points of contact to advocate and communicate with the health care team, access basic needs and resources, and organize services and meetings with school and community agencies (eg, mental health care). For some families, NICH has also involved BFST-D[36] to enhance diabetes-related family dynamics.[69] NICH lowers HbA1c, reduces medical costs, and improves emergency department visits and hospital admissions for preventable diabetes concerns.[70]

Diabetes Technology Considerations and Interventions

Diabetes technology provides psychosocial advantages for youth and their families, including decreased distress, improved HRQOL, greater freedom, and greater control over life and diabetes.[66,71] Among the challenges that could contribute to discontinuation are information overload, device or insertion discomfort, size and visibility of devices, alarm intrusiveness, sensor/adhesive failures, or other technical difficulties.[66] In addition, some youth feel that wearing devices is a constant reminder of diabetes.[66]

Many challenges can be addressed by provider education and psychosocial support. One crucial element may be expectation setting when starting a device. Youth and caregivers may expect technologies to be hands-off[66] and disappointment may lead to device discontinuation. Education should include realistic expectations for what a device can do and what the experience of placing, wearing, and using it entails. Anticipatory guidance can be provided around common challenges with technology to proactively identify and problem solve around concerns (eg, guidelines for caregiver–adolescent communication related to remote monitoring; troubleshooting common issues related to adhesive or sensor malfunctions; strategies to optimize alarms and reduce "fatigue").

Although no reviews have been published specifically on interventions for technology uptake and use, one study on a caregiver-focused intervention for CGM use, Strategies to Enhance New CGM Use in Early Childhood (SENCE),[72] was noted in a review of family-based interventions.[46] Caregivers of young children were taught CBT skills for CGM-related situations (eg, identifying caregiver emotions related to out-of-range glucose levels, cognitive restructuring for negative thoughts about alarms, relaxation, problem-solving, communication skills), resulting in improved caregiver diabetes distress and FOH.[72]

DISCUSSION

Psychosocial care involves understanding the factors that affect diabetes outcomes for youth and families and providing evidence-based interventions to address barriers and build strengths to optimize diabetes care, mental health, and daily functioning. Family-focused interventions that improve communication, collaborative problem-solving, and responsibility sharing are the most robust for improving both glycemic and psychosocial outcomes.[32] Youth-focused interventions frequently teach CBT skills or use MI to increase motivation for change, significantly improving diabetes distress,[22] self-management behaviors,[11] and glycemic outcomes.[11,21] **Fig. 1** summarizes the components from the evidence-based interventions that improve psychosocial, behavioral, or glycemic outcomes in youth with T1D.

Problem-solving and communication skills are both components of effective youth-focused and family-based interventions, suggesting that these approaches are particularly impactful. However, one review identified that problem-solving as a stand-alone

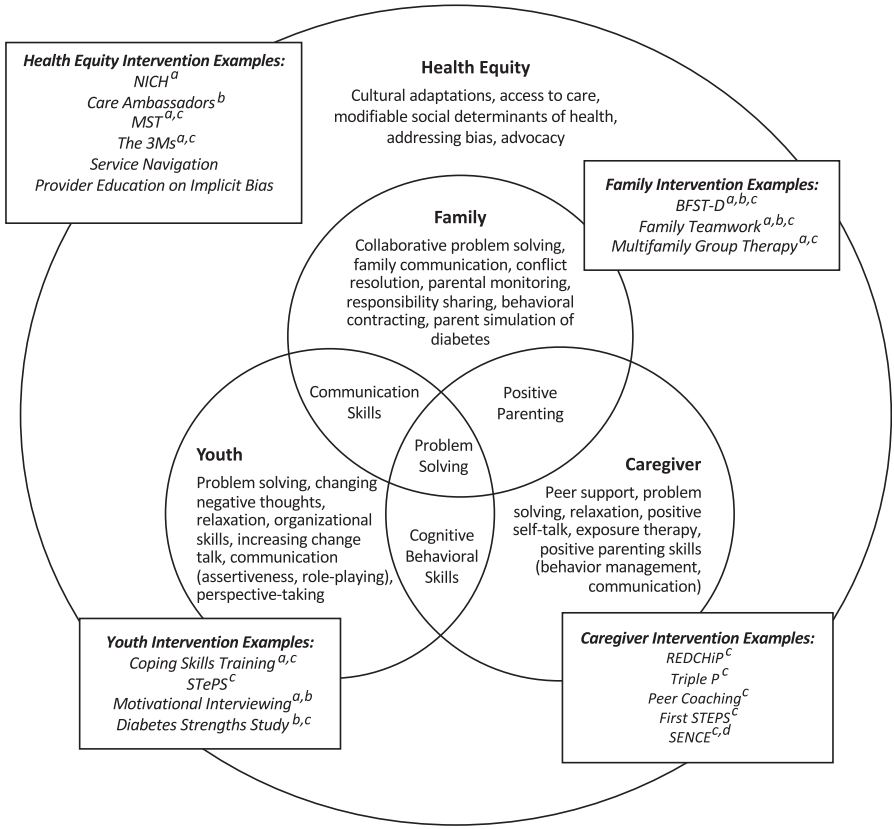

Fig. 1. Intervention components included in evidence-based psychosocial interventions in pediatric diabetes. [a]Improves glycemic outcomes. [b]Improve health behaviors. [c]Improve psychosocial outcomes. [d]Intervention focused on psychosocial aspects of diabetes technology use. NICH, Novel Interventions in Children's Healthcare[69,70]; Care Ambassadors[64]; MST, Multisystemic Therapy[67,68]; The 3Ms[63]; Service Navigation[57,65]; provider education on implicit bias[25,60,66]; BFST-D, Behavioral Family Systems Therapy for Diabetes[35,36]; Family Teamwork[38,39]; multifamily group therapy[40-42]; Coping Skills Training[21]; STePS, Supporting Teen Problem-Solving[22]; motivational interviewing[23]; Diabetes Strengths Study[26]; REDCHiP, Reducing Emotional Distress for Childhood Hypoglycemia in Parents[51]; Triple P, Positive Parenting Program[53]; peer coaching[44,47]; First STEPS, Study of Type 1 in Early Childhood and Parenting Support[46,50]; SENCE, Strategies to Enhance New CGM Use in Early childhood.[72]

approach seems insufficient for improving outcomes, noting that interventions seem most impactful when problem-solving is delivered along with other family-based or youth-focused intervention components over multiple sessions.[12] Further, when problem-solving and communication skills are delivered within a family context, the skills differ from those delivered within a youth-only framework. Specifically, family-based problem-solving refers to a collaborative process involving jointly identifying a problem, setting an attainable goal, listening to feedback from other family members, and selecting a solution that is mutually satisfactory, sometimes requiring negotiation and conflict resolution. In contrast, when conducted individually, youth unilaterally brainstorm, evaluate, select, and implement a chosen solution. Similarly,

communication training in the context of youth-focused interventions teaches youth how to assertively ask for what they need or set boundaries. Family-based communication skills involve open and healthy dialogue to reduce blame, conflict, and miscommunication while increasing productive discussion, perspective-taking, and ability to listen. Both formats improve coping, but only family-based interventions improve conflictual interactions and shared responsibility for diabetes management within the family system; a possible reason family-based interventions seem more successful in improving outcomes. To further develop and study these and other diabetes-specific interventions, researchers should evaluate and compare intervention components to identify specific factors driving outcomes.

Interventions to improve caregiver well-being beyond parenting strategies alone are emerging with preliminary positive effects for caregiver FOH[51] and depressive symptoms.[50] Similarly, health equity interventions are being developed and evaluated, including culturally relevant adaptations and approaches to improving modifiable social determinants of health.[29,61] Interventions addressing technology-based psychosocial challenges are emerging.

Although psychosocial interventions are effective for improving glycemic, behavioral, and psychosocial outcomes for youth and caregivers, access remains limited. In recent studies on implementation of psychosocial screening, the most common barriers to screening in pediatric settings include time constraints, limited perceived impact of screening on medical decision-making, and difficulty knowing how to respond to elevations, including challenges identifying referrals.[73,74] The existing shortage of mental health providers,[75] worsened by the spike in mental health needs during the COVID-19 pandemic,[76] has only increased the barriers families face in accessing psychosocial care.

Solutions are needed to improve access to evidence-based psychosocial care for youth with diabetes. Embedding trained mental health providers within multidisciplinary clinics can improve access to evidence-based, diabetes-specific interventions and reduce the burden of finding and following up with external referrals. Training for diabetes care providers to effectively and thoughtfully deliver components of interventions in brief formats (eg, MI, problem-solving, family communication) may address some diabetes-specific challenges for some families. Community resources and programs can also be provided to families, including organizations providing peer connection, resources to help families with high social needs, and referrals to outpatient therapeutic support via the American Diabetes Association's mental health provider directory.[77] Ongoing training for mental health providers in the community about diabetes-specific considerations and interventions[78] will also increase availability of evidence-based psychosocial care.

The current review summarizes findings from other published reviews, and limitations reflect limited diversity (participants predominately identified as non-Hispanic White and were well-resourced) and small sample sizes. Future research is needed with increased demographic diversity in terms of race, ethnicity, socioeconomic status, and family structure.[11,15] This review also may not include more recent studies published after these prior reviews were completed. To date, no interventions included in reviews target child FOH, disordered eating behaviors (or the diabetes-specific behavior of intentional insulin omission for weight loss), sleep difficulty related to diabetes, or cognitive difficulties (eg, executive function challenges), reflecting unique risks in pediatric diabetes that can negatively impact health and psychological well-being.[3] Additional research is needed to examine pathways to improve glycemic outcomes given mixed findings. Research should also investigate which approach to use for specific individuals and families. Finally, a focus on implementation and

dissemination is critical to increase access to effective interventions. Assessment of cost-effectiveness and facilitators and barriers to implementation are also needed.

CLINICS CARE POINTS

- Psychosocial assessment and evidence-based interventions are of critical importance when working with youth with type 1 diabetes.
- Diabetes-specific psychosocial interventions address barriers to care and build individual and family-based strengths to optimize self-management behaviors and improve psychological well-being.
- Family-based interventions seem strongest for improving outcomes and teach collaborative problem-solving and family communication to resolve common diabetes challenges.
- Youth- and caregiver-only interventions that provide cognitive behavioral and motivational interviewing strategies can also improve diabetes distress, diabetes strengths, quality of life, and glycemic outcomes.
- Clinicians should recognize barriers contributing to health disparities and provide culturally sensitive recommendations and referrals. There are systems-level interventions that can comprehensively support families with the greatest social needs.
- When starting diabetes technology, set realistic expectations and proactively address common challenges to support continued use.

DISCLOSURE

The authors have no conflicts to report.

REFERENCES

1. ElSayed NA, Aleppo G, Aroda VR, et al. Facilitating positive health behaviors and well-being to improve health outcomes: Standards of care in diabetes-2023. Diabetes Care 2023;46(Suppl 1):S68–96.
2. ElSayed NA, Aleppo G, Aroda VR, et al. 14. Children and adolescents: Standards of care in diabetes-2023. Diabetes Care 2023;46(Suppl 1):S230–53.
3. de Wit M, Gajewska KA, Goethals ER, et al. ISPAD Clinical Practice Consensus Guidelines 2022: Psychological care of children, adolescents and young adults with diabetes. Pediatr Diabetes 2022;23(8):1373–89.
4. Gregory JW, Cameron FJ, Joshi K, et al. ISPAD clinical practice consensus guidelines 2022: diabetes in adolescence. Pediatr Diabetes 2022;23(7):857–71.
5. de Bock M, Codner E, Craig ME, et al. ISPAD clinical practice consensus guidelines 2022: glycemic targets and glucose monitoring for children, adolescents, and young people with diabetes. Pediatr Diabetes 2022;23(8):1270–6.
6. Rechenberg K, Whittemore R, Holland M, et al. General and diabetes-specific stress in adolescents with type 1 diabetes. Diabetes Res Clin Pract 2017;130:1–8.
7. Johnson SR, Cooper MN, Davis EA, et al. Hypoglycaemia, fear of hypoglycaemia and quality of life in children with type 1 diabetes and their parents. Diabet Med 2013;30(9):1126–31.
8. Hilliard ME, Minard CG, Marrero DG, et al. Assessing health-related quality of life in children and adolescents with diabetes: Development and psychometrics of the Type 1 Diabetes and Life (T1DAL) measures. J Pediatr Psychol 2020;45(3):328–39.

9. Hilliard ME, Harris MA, Weissberg-Benchell J. Diabetes resilience: a model of risk and protection in type 1 diabetes. Curr Diab Rep 2012;12(6):739–48.
10. Hilliard ME, Iturralde E, Weissberg-Benchell J, et al. The Diabetes Strengths and Resilience Measure for Adolescents with Type 1 Diabetes (DSTAR-Teen): Validation of a new, brief self-report measure. J Pediatr Psychol 2017;42(9):995–1005.
11. Bergmame L, Shaw S. Clinical utility of psychoeducational interventions for youth with type 1 diabetes: a scoping review. Continuity in Education 2021;2(1):76–108.
12. Fitzpatrick SL, Schumann KP, Hill-Briggs F. Problem solving interventions for diabetes self-management and control: a systematic review of the literature. Diabetes Res Clin Pract 2013;100(2):145–61.
13. Hilliard ME, Powell PW, Anderson BJ. Evidence-based behavioral interventions to promote diabetes management in children, adolescents, and families. Am Psychol 2016;71(7):590–601.
14. Hood KK, Rohan JM, Peterson CM, et al. Interventions with adherence-promoting components in pediatric type 1 diabetes. Diabetes Care 2010;33(7):1658–64.
15. Winkley K, Upsher R, Stahl D, et al. Systematic review and meta-analysis of randomized controlled trials of psychological interventions to improve glycaemic control in children and adults with type 1 diabetes. Diabet Med 2020;37(5):735–46.
16. Wu Y, Zhang YY, Zhang YT, et al. Effectiveness of resilience-promoting interventions in adolescents with diabetes mellitus: a systematic review and meta-analysis. World J Pediatr 2023;19(4):323–39.
17. Winkley K, Ismail K, Landau S, et al. Psychological interventions to improve glycaemic control in patients with type 1 diabetes: Systematic review and meta-analysis of randomized controlled trials. BMJ 2006;333(7558):65.
18. Savage E, Farrell D, McManus V, et al. The science of intervention development for type 1 diabetes in childhood: Systematic review. J Adv Nurs 2010;66(12):2604–19.
19. Bandura A. Health promotion from the perspective of social cognitive theory. Psychol Health 1998;13(4):623–49.
20. Miller WR, Rose GS. Toward a theory of motivational interviewing. Am Psychol 2009;64(6):527–37.
21. Grey M, Boland EA, Davidson M, et al. Coping skills training for youth with diabetes mellitus has long-lasting effects on metabolic control and quality of life. J Pediatr 2000;137(1):107–13.
22. Weissberg-Benchell J, Shapiro JB, Bryant FB, et al. Supporting Teen Problem-Solving (STePS) 3 year outcomes: Preventing diabetes-specific emotional distress and depressive symptoms in adolescents with type 1 diabetes. J Consult Clin Psychol 2020;88(11):1019–31.
23. Gayes LA, Steele RG. A meta-analysis of motivational interviewing interventions for pediatric health behavior change. J Consult Clin Psychol 2014;82(3):521–35.
24. Barry-Menkhaus SA, Wagner DV, Riley AR. Small interventions for big change: Brief strategies for distress and self-management amongst youth with type 1 diabetes. Curr Diab Rep 2020;20(1):3.
25. Ellis D.A. and Naar S., Interventions across the translational research spectrum: Addressing disparities among racial and ethnic minoritized youth with type 1 diabetes, *Endocrinol Metab Clin North Am*, 52 (4), 2023, 585-602.
26. Hilliard ME, Eshtehardi SS, Minard CG, et al. Featured article: Strengths-based, clinic-integrated nonrandomized pilot intervention to promote type 1 diabetes adherence and well-being. J Pediatr Psychol 2019;44(1):5–15.

27. Pierce JS, Kozikowski C, Lee JM, et al. Type 1 diabetes in very young children: a model of parent and child influences on management and outcomes. Pediatr Diabetes 2017;18(1):17–25.
28. Gruhn MA, Lord JH, Jaser SS. Collaborative and overinvolved parenting differentially predict outcomes in adolescents with type 1 diabetes. Health Psychol 2016; 35(7):652–60.
29. Butler A, Georges T, Anderson B. Family Influences. In: Delamater A, Marrero D, editors. *Behavioral diabetes*. Cham, Switzerland: Springer; 2020. p. 105–20.
30. Monaghan M, Horn IB, Alvarez V, et al. Authoritative parenting, parenting stress, and self-care in pre-adolescents with type 1 diabetes. J Clin Psychol Med Settings 2012;19(3):255–61.
31. Tsiouli E, Alexopoulos EC, Stefanaki C, et al. Effects of diabetes-related family stress on glycemic control in young patients with type 1 diabetes: Systematic review. Can Fam Physician 2013;59(2):143–9.
32. Feldman MA, Anderson LM, Shapiro JB, et al. Family-based interventions targeting improvements in health and family outcomes of children and adolescents with type 1 diabetes: a systematic review. Curr Diab Rep 2018;18(3):15.
33. McBroom LA, Enriquez M. Review of family-centered interventions to enhance the health outcomes of children with type 1 diabetes. Diabetes Educ 2009;35(3): 428–38.
34. Ispriantari A, Agustina R, Konlan KD, et al. Family-centered interventions for children and adolescents with type 1 diabetes mellitus: an integrative review. Child Health Nurs Res 2023;29(1):7–23.
35. Wysocki T, Greco P, Harris MA, et al. Behavior therapy for families and adolescents with diabetes: Maintenance of treatment effects. Diabetes Care 2001; 24(3):441–6.
36. 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 Mar;30(3):555–60.
37. Boland L, Graham ID, Légaré F, et al. Barriers and facilitators of pediatric shared decision-making: a systematic review. Implement Sci 2019;14(1):7.
38. Anderson BJ, Brackett J, Ho J, et al. 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(5):713–21.
39. Laffel LMB, Vangsness L, Connell A, et al. Impact of ambulatory, family-focused teamwork intervention on glycemic control in youth with type 1 diabetes. J Pediatr 2003;142(4):409–16.
40. Kichler JC, Kaugars AS, Marik P, et al. Effectiveness of groups for adolescents with type 1 diabetes mellitus and their parents. Fam Syst Health 2013;31(3): 280–93.
41. Carpenter JL, Price JEW, Cohen MJ, et al. Multifamily group problem-solving intervention for adherence challenges in pediatric insulin-dependent diabetes. Clin Pract Pediatr Psychol 2014;2(2):101–15.
42. Satin W, La Greca AM, Zigo MA, et al. Diabetes in adolescence: Effects of multifamily group intervention and parent simulation of diabetes. J Pediatr Psychol 1989;14(2):259–75.
43. Lohan A, Morawska A, Mitchell A. A systematic review of parenting interventions for parents of children with type 1 diabetes. Child Care Health Dev 2015;41(6): 803–17.

44. Tully C, Shneider C, Monaghan M, et al. Peer coaching interventions for parents of children with type 1 diabetes. Curr Diab Rep 2017;17(6):39.
45. Zhao X, Ai Z, Chen Y, et al. The effectiveness of parenting interventions on psychosocial adjustment in parents of children and adolescents with type 1 diabetes: a meta-analysis. Worldviews Evid Based Nurs 2019;16(6):462–9.
46. Monaghan M, Bryant BL, Inverso H, et al. Young children with type 1 diabetes: Recent advances in behavioral research. Curr Diab Rep 2022;22(6):247–56.
47. Sullivan-Bolyai S, Grey M, Deatrick J, et al. Helping other mothers effectively work at raising young children with type 1 diabetes. Diabetes Educ 2004;30(3):476–84.
48. Mackey ER, Herbert L, Monaghan M, et al. The feasibility of a pilot intervention for parents of young children newly diagnosed with type 1 diabetes. Clin Pract Pediatr Psychol 2016;4(1):35–50.
49. Sullivan-Bolyai S, Bova C, Leung K, et al. Social Support to Empower Parents (STEP): an intervention for parents of young children newly diagnosed with type 1 diabetes. Diabetes Educ 2010;36(1):88–97.
50. Hilliard ME, Tully C, Monaghan M, et al. First STEPS: Primary outcomes of a randomized, stepped-care behavioral clinical trial for parents of young children with new-onset type 1 diabetes. Diabetes Care 2022;45(10):2238–46.
51. Patton SR, Clements MA, Marker AM, et al. Intervention to reduce hypoglycemia fear in parents of young kids using video-based telehealth (REDCHiP). Pediatr Diabetes 2020;21(1):112–9.
52. Monaghan M, Hilliard ME, Cogen FR, et al. Supporting parents of very young children with type 1 diabetes: Results from a pilot study. Patient Educ Couns 2011;82(2):271–4.
53. Westrupp EM, Northam E, Lee KJ, et al. Reducing and preventing internalizing and externalizing behavior problems in children with type 1 diabetes: a randomized controlled trial of the Triple P-Positive Parenting Program. Pediatr Diabetes 2015;16(7):554–63.
54. Saßmann H, de Hair M, Danne T, et al. Reducing stress and supporting positive relations in families of young children with type 1 diabetes: a randomized controlled study for evaluating the effects of the DELFIN parenting program. BMC Pediatr 2012;12:152.
55. Hill-Briggs F, Adler NE, Berkowitz SA, et al. Social determinants of health and diabetes: a scientific review. Diabetes Care 2021;44(1):258–79.
56. Borschuk AP, Everhart RS. Health disparities among youth with type 1 diabetes: a systematic review of the current literature. Fam Syst Health 2015;33(3):297–313.
57. Butler AM, Brown SD, Carreon SA, et al. Equity in psychosocial outcomes and care for racial and ethnic minorities and socioeconomically disadvantaged people with diabetes. Diabetes Spectr 2022;35(3):276–83.
58. Hagger V, Hendrieckx C, Sturt J, et al. Diabetes distress among adolescents with type 1 diabetes: a systematic review. Curr Diab Rep 2016;16(1):9.
59. Walker AF, Schatz DA, Johnson C, et al. Disparities in social support systems for youth with type 1 diabetes. Clin Diabetes 2015;33(2):62–9.
60. Addala A, Hanes S, Naranjo D, et al. Provider implicit bias impacts pediatric type 1 diabetes technology recommendations in the United States: Findings from The Gatekeeper Study. J Diabetes Sci Technol 2021;15(5):1027–33.
61. Wagner DV, Koskela-Staples N, Harris MA, et al. All systems go: an ecological perspective of behavioral health for youth with type 1 diabetes. Fam Syst Health 2019;37:10–29.

62. Akindana A, Owens-Gary M, Williams A. When it all gets to be too much: Addressing diabetes distress in African Americans. AADE Pract 2016;4(4):44–9.
63. Ellis DA, Idalski Carcone A, Ondersma SJ, et al. Brief computer-delivered intervention to increase parental monitoring in families of African American adolescents with type 1 diabetes: A randomized controlled trial. Telemed J e Health 2017; 23(6):493–502.
64. Svoren BM, Butler D, Levine BS, et al. Reducing acute adverse outcomes in youths with type 1 diabetes: a randomized, controlled trial. Pediatrics 2003; 112(4):914–22.
65. Gottlieb LM, Hessler D, Long D, et al. Effects of social needs screening and in-person service navigation on child health: a randomized clinical trial. JAMA Pediatr 2016;170(11):e162521.
66. Brew-Sam N, Chhabra M, Parkinson A, et al. Experiences of young people and their caregivers of using technology to manage type 1 diabetes mellitus: Systematic literature review and narrative synthesis. JMIR Diabetes 2021;6(1):e20973.
67. Ellis DA, Frey MA, Naar-King S, et al. The effects of multisystemic therapy on diabetes stress among adolescents with chronically poorly controlled type 1 diabetes: Findings from a randomized, controlled trial. Pediatrics 2005;116(6): e826–32.
68. Ellis DA, Carcone AI, Naar-King S, et al. Adaptation of an evidence-based diabetes management intervention for delivery in community settings: Findings from a pilot randomized effectiveness trial. J Pediatr Psychol 2019;44(1): 110–25.
69. Harris MA, Wagner DV, Heywood M, et al. Youth repeatedly hospitalized for DKA: proof of concept for novel interventions in children's healthcare (NICH). Diabetes Care 2014;37(6):e125–6.
70. Wagner DV, Barry SA, Stoeckel M, et al. NICH at its best for diabetes at its worst: Texting teens and their caregivers for better outcomes. J Diabetes Sci Technol 2017;11(3):468–75.
71. Papadakis JL, Anderson LM, Garza K, et al. Psychosocial aspects of diabetes technology use. Endocrinol Metab Clin North Am 2020;49(1):127–41.
72. Strategies to Enhance New CGM Use in Early Childhood SENCE Study Group. A randomized clinical trial assessing continuous glucose monitoring (CGM) use with standardized education with or without a family behavioral intervention compared with fingerstick blood glucose monitoring in very young children with type 1 diabetes. Diabetes Care 2021;44(2):464–72.
73. Anderson LM, Papadakis JL, Vesco AT, et al. Patient-reported and parent proxy-reported outcomes in pediatric medical specialty clinical settings: A systematic review of implementation. J Pediatr Psychol 2020;45(3):247–65.
74. Corathers S, Williford DN, Kichler J, et al. Implementation of psychosocial screening into diabetes clinics: Experience from the type 1 diabetes exchange quality improvement network. Curr Diab Rep 2023;23(2):29.
75. Butryn T, Bryant L, Marchionni C, et al. The shortage of psychiatrists and other mental health providers: Causes, current state, and potential solutions. Int J Acad Med 2017;3:5–9.
76. Radhakrishnan L, Leeb RT, Bitsko RH, et al. Pediatric emergency department visits associated with mental health conditions before and during the COVID-19 pandemic - United States, January 2019-January 2022. MMWR Morb Mortal Wkly Rep 2022;71(8):319–24.

77. Mental health directory. In: American Diabetes Association: DiabetesPro. 1995–2022. Available at: https://my.diabetes.org/health-directory. Accessed August 1, 2023.
78. Behavioral health resources. In: American Diabetes Association: DiabetesPro. 1995-2022. Available at: https://professional.diabetes.org/meeting/other/behavioral-health-resources. Accessed August 1, 2023.