Research Article

Beyond Glycaemic Control: Psychosocial Well-Being And Quality of Life in Adolescents With Type 1 Diabetes Mellitus – A Review Article

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ABSTRACT

Introduction: Adolescence is a period of significant physical, emotional, and social development. For young people living with type 1 diabetes mellitus (T1DM), these changes occur alongside the continuing demands of diabetes management, which may affect psychological well-being and health-related quality of life.

Objective: To review the evidence on psychosocial challenges and health-related quality of life among adolescents with T1DM and identify implications for adolescent-centred nursing and multidisciplinary care.

Data sources: This narrative review draws on international clinical practice guidelines, peer-reviewed literature, and publications addressing adolescent diabetes management, psychological well-being, family functioning, social relationships, and quality of life. Relevant literature was identified through searches of biomedical literature resources and reference lists of key publications, with priority given to clinical guidelines, systematic reviews, and studies involving adolescents with T1DM.

Data synthesis: Adolescents with T1DM face interconnected physical, emotional, familial, and social challenges arising from lifelong insulin therapy, glucose monitoring, dietary planning, and the prevention of acute complications. Diabetes distress, anxiety, depressive symptoms, fear of hypoglycaemia, body image concerns, and treatment fatigue may affect self-management and everyday functioning. Family conflict, peer relationships, school experiences, stigma, and financial limitations can further influence quality of life. Evidence-informed care emphasizes developmentally appropriate diabetes education, collaborative family involvement, routine psychosocial assessment, access to mental health professionals, and individualized support for self-management. Although diabetes technologies may reduce some treatment demands, their use can introduce concerns related to cost, privacy, device visibility, and continuous monitoring.

Conclusion: Psychological and social well-being should be considered essential components of comprehensive diabetes care during adolescence. Integrating psychosocial assessment, family support, school collaboration, and individualized nursing interventions may strengthen coping, encourage treatment engagement, and support better health-related quality of life. Further context-specific research is needed to identify feasible and effective interventions, particularly in resource-constrained settings.

Keywords: Adolescents; Type 1 Diabetes Mellitus; Health-Related Quality of Life; Psychological Stress; Family Relations; Nursing Care.

INTRODUCTION

Adolescence is marked by rapid physical growth, emotional changes, the development of personal identity, increasing independence, and a growing need for peer acceptance. These changes can be especially challenging for adolescents living with type 1 diabetes mellitus (T1DM), a chronic autoimmune condition that requires lifelong insulin replacement and regular attention to blood glucose levels. Daily management involves repeated decisions about insulin administration, glucose monitoring, food intake, physical activity, and the prevention and treatment of hypoglycaemia and hyperglycaemia. Adolescents must manage these responsibilities while meeting academic expectations, maintaining friendships, participating in social activities, and gradually assuming greater responsibility for their own care.

Managing T1DM during adolescence involves more than achieving satisfactory glycaemic control. Biological changes associated with puberty, emotional development, family relationships, and social expectations can all influence how young people manage their condition. Adolescents may understand the importance of treatment but still struggle to follow their care routines consistently because of competing priorities, emotional distress, fear of being different, or discomfort with managing diabetes in public. Pubertal changes in insulin sensitivity

may also make glucose regulation more challenging. International guidelines therefore emphasize the need to address developmental and psychosocial concerns alongside clinical outcomes [1,2].

Health-related quality of life (HRQoL) describes an individual's perception of how health and illness affect physical, emotional, social, and everyday functioning. For adolescents with T1DM, it includes not only glycaemic control and the prevention of complications but also the ability to attend school, maintain friendships, participate in activities, develop independence, and pursue personal goals. An adolescent may achieve acceptable glycaemic outcomes while experiencing considerable emotional distress or treatment burden. Similarly, difficulties with glucose regulation should not automatically be interpreted as a lack of motivation or willingness to manage the condition.

Psychosocial challenges can influence self-management, treatment engagement, family relationships, and overall well-being. Diabetes distress refers to the emotional burden associated with the ongoing demands of diabetes care. Although it may occur alongside anxiety or depression, it is not the same as a psychiatric disorder. Fear of hypoglycaemia, frustration with unpredictable glucose levels, concerns about future complications, and the need to remain constantly attentive to treatment can all contribute to distress [1,3].

Family members often provide practical assistance and emotional reassurance. However, disagreements may arise when parents attempt to maintain control while adolescents seek greater independence. Excessive supervision, criticism, or the premature transfer of treatment responsibilities may complicate self-management. Peer relationships and the school environment are equally important because adolescents spend much of their time away from home and may need access to insulin, glucose monitoring, appropriate meals, and emergency assistance during the school day.

Current diabetes guidelines consequently emphasize that psychosocial support should form part of routine clinical care rather than being offered only when difficulties become severe [1,2]. Understanding the challenges adolescents face is therefore important for developing care that responds to their clinical needs as well as their emotional, social, and developmental circumstances.

OBJECTIVE

To synthesize available evidence on psychosocial challenges and HRQoL among adolescents with T1DM, focusing on psychological well-being, family functioning, peer relationships, school participation, diabetes self-management, and implications for nursing practice.

METHODS

Review design

A narrative evidence-based review was undertaken to bring together relevant clinical guidelines and published literature concerning psychosocial well-being and quality of life among adolescents with T1DM. The review was intended to provide a clinically relevant overview of the topic rather than to calculate pooled effect estimates or establish causal relationships.

Literature identification

Relevant literature was explored through biomedical literature resources, including PubMed and PubMed Central, as well as clinical practice guideline publications and the reference lists of key articles. Search terms included combinations of “type 1 diabetes mellitus,” “adolescents,” “psychosocial challenges,” “diabetes distress,” “depression,” “anxiety,” “family support,” “school,” “self-management,” and “health-related quality of life.”

Priority was given to international consensus guidelines, professional diabetes care standards, systematic reviews, and peer-reviewed studies involving adolescents and other young people with T1DM. Literature addressing family involvement, psychological assessment, diabetes technology, and school-based support was also considered where relevant to adolescent care.

Evidence synthesis

The literature was reviewed thematically, with findings organized into psychological and emotional challenges, treatment burden and self-management, family relationships, peer and school experiences, HRQoL, and implications for clinical practice. Recommendations from professional guidelines were distinguished from broader interpretations of the literature.

A fully reproducible systematic search, independent screening, formal risk-of-bias assessment, and quantitative synthesis were not undertaken. The manuscript should therefore be understood as a narrative review rather than a systematic review. Its findings are intended to inform clinical understanding and future research, not to establish causality or estimate pooled prevalence.

PSYCHOSOCIAL CHALLENGES AMONG ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS

1. Psychological and emotional challenges

Diabetes distress

The daily demands of diabetes management can become emotionally exhausting, particularly when treatment requires constant attention and glucose levels remain unpredictable. Adolescents may feel frustrated by frequent monitoring, insulin administration, dietary planning, and the need to remain alert to changes in glucose levels, even during activities they would otherwise enjoy. Repeated difficulty meeting glucose targets may also contribute to guilt, helplessness, or reduced confidence in managing the condition.

Diabetes distress should not be mistaken for non-adherence or a psychiatric disorder. An adolescent who expresses frustration may be communicating that the treatment plan has become difficult to manage within everyday life. Rather than responding with criticism, healthcare professionals should explore the source of the distress and work with the adolescent and family to identify realistic ways of reducing the burden of care [1,3].

Anxiety and fear of hypoglycaemia

Fear of hypoglycaemia can affect both adolescents and their caregivers. Symptoms such as sweating, trembling, dizziness, and confusion may be particularly frightening when they occur at school, during exercise, while travelling, or at night. These concerns may lead some adolescents to avoid physical activity or maintain glucose levels above recommended targets because they fear a hypoglycaemic episode.

Anxiety may also arise from examinations, social activities, insulin administration in public, anticipated complications, or uncertainty about future health. When persistent, these concerns can interfere with sleep, concentration, social participation, and treatment engagement. Healthcare professionals should assess the nature and extent of these fears and provide individualized education, practical guidance, and psychological support where needed.

Depressive symptoms and emotional well-being

Some adolescents with T1DM experience persistent sadness, irritability, reduced motivation, social withdrawal, or a sense of being different from their peers. These experiences may be associated with diabetes distress, developmental difficulties, depressive symptoms, or several interacting factors. Changes in mood or behaviour should not automatically be dismissed as a normal part of adolescence.

The International Society for Pediatric and Adolescent Diabetes (ISPAD) recommends developmentally appropriate psychosocial assessment, including attention to depressive symptoms and diabetes distress [1]. A positive screening result should lead to further assessment rather than being treated as a confirmed diagnosis. Persistent low mood, hopelessness, self-harm, or suicidal thoughts require prompt clinical evaluation and appropriate referral.

Body image and disordered eating

Adolescence is often accompanied by greater awareness of physical appearance, body shape, and peer acceptance. Weight-related concerns, changes associated with insulin treatment, and exposure to unrealistic appearance standards may add to the emotional burden of T1DM. Some adolescents may restrict food intake, conceal aspects of their treatment, or misuse insulin in an attempt to influence their weight.

Insulin omission for weight control is particularly dangerous because it can cause severe hyperglycaemia and diabetic ketoacidosis. Healthcare professionals should discuss eating and body image concerns sensitively, avoid stigmatizing language, and assess changes in eating patterns, weight-related distress, and insulin use when clinically indicated [1,2].

2. Treatment burden and diabetes self-management

Effective diabetes management requires ongoing decisions about insulin doses, glucose monitoring, meals, physical activity, and responses to illness. These tasks must be fitted around schoolwork, leisure activities, friendships, and family responsibilities, which can make consistent self-management difficult.

Some adolescents develop treatment fatigue when diabetes routines become repetitive or when they feel that the condition dominates their daily lives. They may delay monitoring, forget insulin doses, or avoid discussing glucose results because they anticipate criticism. Such difficulties may reflect emotional distress, practical barriers, competing priorities, or challenges with planning and organization rather than a deliberate refusal to participate in care.

The transition from parent-managed treatment to greater adolescent independence requires particular care. Adolescents need opportunities to develop confidence and self-management skills, but the pace of this transition should reflect their readiness and circumstances. ISPAD guidance supports increasing responsibility gradually while maintaining collaborative parental involvement [1,4]. Transferring all treatment responsibilities too early may leave adolescents feeling overwhelmed and may compromise consistent care.

Continuous glucose monitoring and automated insulin delivery systems can simplify some aspects of diabetes management and provide useful information for treatment decisions. However, alarms, technical problems, device visibility, information overload, financial costs, and privacy concerns may create additional demands. Decisions about technology should take account of clinical needs, affordability, personal preferences, and the availability of appropriate education and support [4,5].

3. Family relationships and parental involvement

Family relationships play an important role in how adolescents experience and manage T1DM. Parents and caregivers may assist with insulin administration, glucose monitoring, meal planning, clinic visits, and the prevention or management of acute complications. As adolescents seek greater independence, disagreements can develop over supervision, privacy, treatment decisions, and responsibility for daily care.

Excessive parental control may feel intrusive, whereas insufficient involvement may leave an adolescent struggling to manage a demanding treatment routine alone. Repeated criticism of glucose readings, questioning that feels accusatory, or punishment for treatment difficulties can increase family conflict and discourage open communication. In contrast, respectful discussion, shared problem-solving, and emotional reassurance can help adolescents develop autonomy while remaining connected to family support.

Caregivers may also experience anxiety, disrupted sleep, financial pressure, and persistent concern about acute complications. These pressures can affect the wider family environment and influence how diabetes is managed at home. Psychosocial care should therefore consider the needs of caregivers as well as those of the adolescent [1,2].

Family-centred care does not require parents to make every decision. Instead, it involves agreeing on responsibilities according to the adolescent's developmental maturity, practical skills, safety needs, and preferences. Regular conversations about who will manage specific tasks can prevent misunderstandings and support a gradual transition toward independent diabetes care.

4. Peer relationships, stigma, and social participation

Friendships and peer acceptance are central to adolescent development. Diabetes management can make some young people feel conspicuous or different, particularly when they need to check glucose levels, administer insulin, or treat hypoglycaemia in front of others. Concerns about embarrassment or unwanted attention may lead them to conceal their diagnosis or delay necessary care in social settings.

Misunderstandings about diabetes may result in inappropriate comments, unwanted advice, exclusion from activities, or assumptions that an adolescent cannot safely participate in sports and other events. Such experiences can affect self-confidence and reduce social participation.

Supportive friendships can help adolescents feel accepted and provide practical assistance when needed. With the adolescent's agreement, appropriate peer education may help friends recognize hypoglycaemia and understand how to respond during an emergency. However, disclosure of the diagnosis should respect the adolescent's privacy and preferences.

Healthcare professionals should ask whether social concerns are affecting diabetes management and help adolescents develop comfortable ways of explaining their needs. The aim should be to support participation in ordinary adolescent activities while ensuring that diabetes care remains safe and manageable.

5. School-related challenges

Schools are important settings for diabetes management because adolescents spend a substantial part of each day away from their caregivers. Difficulties may arise when students cannot easily access glucose monitoring, insulin administration, meals, drinking water, toilets, or a suitable place to manage their treatment. Examinations, sports, school trips, and changes in meal schedules can create additional challenges.

Teachers and other school staff may have limited knowledge of diabetes or may be unfamiliar with the signs and treatment of hypoglycaemia. Some adolescents may hesitate to ask for assistance because they fear embarrassment or unwanted attention. These barriers can affect concentration, attendance, participation, and overall quality of life.

An individualized school diabetes plan should outline the adolescent's routine care requirements, access to prescribed treatment, emergency procedures, and the responsibilities of trained staff. Such a plan should respect confidentiality and age-appropriate independence while ensuring that assistance is available when necessary. Diabetes guidance emphasizes coordination between healthcare teams, families, and schools to support safe and inclusive participation [6].

School-based support should be organized in a way that avoids unnecessarily singling out the adolescent. Teachers, school nurses where available, families, and diabetes teams can work together to improve safety and enable participation in academic, social, and extracurricular activities.

6. Socioeconomic and healthcare access challenges

Diabetes self-management is influenced by access to insulin, glucose monitoring supplies, specialist appointments, healthy food, transport, reliable health information, and appropriate technology. Financial difficulties may force families to prioritize essential expenses, postpone follow-up appointments, or limit access to monitoring supplies and other aspects of care.

Health literacy, geographic distance from specialist services, caregiver work schedules, and the availability of trained school personnel can create further barriers. Adolescents in resource-constrained settings may also have limited access to psychological services and advanced diabetes technologies.

These circumstances should be considered when assessing treatment difficulties. A care plan that assumes uninterrupted access to devices, frequent specialist appointments, or extensive caregiver supervision may not be practical for every family. The American Diabetes Association emphasizes the importance of considering social determinants of health, financial barriers, and access to community resources when planning diabetes care [2].

In India and other settings where healthcare resources are unevenly distributed, adolescent diabetes services need to consider affordability, continuity of insulin access, family education, school preparedness, and pathways for psychological referral. Further context-specific research is needed to determine which approaches are feasible and effective across different socioeconomic groups.

HEALTH-RELATED QUALITY OF LIFE

HRQoL reflects how individuals perceive the effects of illness and treatment on their physical, emotional, social, and everyday functioning. Among adolescents with T1DM, quality of life is shaped by the interaction of symptoms, treatment demands, psychological adjustment, family relationships, social acceptance, and access to healthcare.

Physical functioning

Glucose fluctuations, hypoglycaemia, hyperglycaemia, fatigue, sleep disruption, and the time needed for daily treatment can interfere with sports, recreation, and other activities. Fear of acute complications may also lead adolescents or their families to restrict participation unnecessarily, even when activities can be undertaken safely with appropriate planning. Individualized education and practical guidance can help young people remain active while managing diabetes-related risks.

Emotional functioning

Emotional well-being includes the ability to cope with treatment demands, maintain confidence, manage distress, and feel hopeful about the future. Diabetes distress, anxiety, depressive symptoms, and fear of complications may undermine this aspect of quality of life. However, experiences vary between individuals, and psychological difficulties should not be assumed solely on the basis of a diabetes diagnosis or a particular level of glycaemic control.

Social functioning

Social quality of life includes relationships with friends and family, participation in extracurricular activities, and freedom from stigma or unnecessary restrictions. Adolescents who feel accepted and supported may find it easier to incorporate diabetes management into everyday life. In contrast, concealment, social isolation, family conflict, or restrictions imposed by others may reduce satisfaction with social relationships and activities.

School and role functioning

Diabetes management may affect concentration, attendance, examination participation, and the ability to complete schoolwork. These difficulties may be related to glucose fluctuations, emotional stress, treatment interruptions, or inadequate institutional support. Appropriate school accommodations and access to diabetes care during the school day can reduce avoidable disruption and promote equal participation.

Factors associated with quality of life

HRQoL is not determined by a single clinical measure. Glycaemic outcomes, treatment complexity, diabetes duration, complications, family functioning, socioeconomic circumstances, psychological well-being, and perceived autonomy may all contribute. The relationship between these factors is also likely to be reciprocal: emotional distress may make self-management more difficult, while challenging glucose patterns may increase distress.

For this reason, HbA1c and other metabolic indicators should be considered alongside the adolescent's own account of treatment burden and daily functioning. ISPAD recommends the use of developmentally appropriate, validated measures to assess psychosocial well-being in young people with diabetes [1].

EVIDENCE-BASED STRATEGIES TO IMPROVE PSYCHOSOCIAL WELL-BEING

Routine psychosocial assessment

Psychosocial assessment should be incorporated into regular diabetes follow-up rather than reserved for situations in which distress has become severe. Discussions should cover mood, anxiety, diabetes distress, eating-related concerns, family conflict, peer relationships, school participation, and barriers to treatment.

Validated, age-appropriate screening tools can help identify concerns and guide clinical conversations. However, these tools should support rather than replace professional assessment and direct discussion with the adolescent. Identified concerns should be followed by appropriate care, referral, and reassessment.

Family-centred and developmentally appropriate care

Healthcare professionals should encourage shared decision-making, respectful communication, and a gradual transfer of treatment responsibilities. Families may benefit from structured conversations about treatment roles, problem-solving, and responding to glucose results without blame.

The level of support should be adjusted as the adolescent's maturity, confidence, and self-management skills develop. Maintaining a collaborative relationship can help balance the need for safety with the adolescent's growing desire for independence.

Psychological and behavioural interventions

When psychological difficulties are identified, support may include diabetes-focused cognitive behavioural approaches, problem-solving interventions, motivational interviewing, coping-skills training, and family-based interventions. The choice of approach should reflect the adolescent's needs, preferences, cultural context, and access to services.

Professional guidelines emphasize the involvement of qualified mental health professionals within interdisciplinary diabetes care [1,3]. Psychosocial interventions may improve selected psychological and behavioural outcomes, although their effects on glycaemic outcomes vary according to the intervention, population, and care setting.

Diabetes self-management education

Diabetes education should be practical, individualized, and revisited as adolescents' needs change. Young people need opportunities to develop skills in insulin administration, glucose monitoring, recognition and treatment of glucose abnormalities, planning for physical activity, and responding to illness or emergencies.

Education should build competence and confidence rather than rely on fear, blame, or criticism. Involving adolescents in decisions about their care can also help make treatment plans more realistic and acceptable.

Peer and school support

With the adolescent's consent, collaboration between families, school personnel, and healthcare professionals can improve safety and encourage participation. School plans should address access to necessary supplies, emergency procedures, trained support, and reasonable arrangements for examinations and activities.

Peer education may also be helpful when it reflects the adolescent's preferences and protects confidentiality. The goal is to foster understanding and inclusion without placing pressure on young people to disclose information they would prefer to keep private.

Individualized use of diabetes technology

Continuous glucose monitoring and insulin delivery technologies can support treatment decisions and reduce some practical demands of diabetes management. Nevertheless, cost, accessibility, usability, privacy, and emotional responses to device alerts should be considered before and during their use.

Technology should be introduced with appropriate education and ongoing support. It should complement, rather than replace, psychosocial assessment, diabetes education, and supportive relationships with families and healthcare professionals.

Measurement of quality of life

Clinical services should consider assessing quality of life alongside metabolic outcomes. Validated pediatric diabetes-specific instruments, including the Pediatric Quality of Life Inventory Diabetes Module, may help identify areas of difficulty that require further attention.

Scores should be interpreted according to the instrument's validated scoring guidance and considered alongside the adolescent's own account of their experiences. Quality-of-life measures are most useful when they inform shared care planning rather than classify young people as successful or unsuccessful in managing diabetes.

IMPLICATIONS FOR NURSING PRACTICE

Nurses are well placed to identify psychosocial concerns, provide diabetes education, support families, and coordinate care among adolescents, schools, and other healthcare professionals. Their role extends beyond monitoring clinical indicators to understanding how diabetes affects everyday life.

First, nursing assessment should explore the adolescent's understanding of diabetes, perceived treatment burden, emotional responses, and confidence in self-management, family relationships, and school experiences.

Open-ended questions can help reveal concerns that may not be apparent from glucose readings or HbA1c results alone.

Second, nurses should communicate in a supportive and non-judgmental manner. Instead of asking why an adolescent has not followed a treatment plan, they can explore what made the plan difficult and what changes might make it more manageable. This approach may encourage honest discussion about missed insulin doses, fear of hypoglycaemia, treatment fatigue, or other difficulties.

Third, nurses should help families develop an appropriate balance between supervision and independence. Responsibility for diabetes care should increase gradually according to the adolescent's readiness, skills, and safety needs. Family education should emphasize encouragement, practical problem-solving, and responses to treatment difficulties that avoid blame.

Fourth, nurses should work with school personnel and community services, where available, to improve access to diabetes supplies, emergency support, and inclusive participation in school activities. They can also help families understand care plans and identify barriers that require referral or additional resources.

Finally, nurses should recognize concerns that warrant further assessment or specialist referral, including persistent depressive symptoms, severe anxiety, disordered eating, repeated insulin omission, recurrent acute complications, self-harm, or suicidal thoughts. Immediate safety concerns require urgent assessment and appropriate escalation in accordance with clinical protocols.

Through these activities, nurses can help integrate psychosocial care into routine diabetes management and ensure that the adolescent's priorities, circumstances, and quality of life remain central to clinical decision-making.

RESEARCH GAPS AND FUTURE DIRECTIONS

Further research is needed to clarify the relationships between psychosocial functioning, diabetes self-management, and quality of life among adolescents with T1DM. Longitudinal studies and intervention-based research could help establish how these factors change over time and identify approaches that produce meaningful improvements. Studies should distinguish diabetes distress from depressive and anxiety disorders and use validated instruments suited to adolescent populations and their cultural contexts.

Additional research should examine school-based diabetes support, family interventions, peer acceptance, digital interventions, and the psychological effects of diabetes technology. In India and other resource-constrained settings, studies should investigate affordability, continuity of care, access to mental health services, health literacy, and socioeconomic inequalities.

Future evaluations should report clinically meaningful outcomes alongside statistical significance. Psychological well-being, treatment burden, family functioning, school participation, quality of life, and safety should be considered together rather than relying exclusively on glycaemic measures. Clear reporting of sampling methods, study limitations, and contextual factors would also strengthen the relevance of findings for clinical practice.

LIMITATIONS OF THE REVIEW

This narrative review presents a thematic synthesis of relevant literature rather than an exhaustive systematic evaluation of all available evidence. The literature identification process was not designed as a fully reproducible systematic search, and independent screening, formal risk-of-bias assessment, and evidence grading were not undertaken. Differences in study populations, assessment instruments, healthcare systems, and definitions of psychosocial outcomes may also limit comparisons between studies. Accordingly, the review cannot establish causal relationships or quantify the overall effects of psychosocial interventions on quality of life.

CONCLUSION

Adolescents living with T1DM face challenges that extend beyond insulin administration and glucose monitoring. Diabetes distress, anxiety, depressive symptoms, body image concerns, treatment fatigue, family conflict, peer stigma, school-related barriers, and financial difficulties may affect both quality of life and engagement in self-management.

Comprehensive adolescent diabetes care should therefore combine routine psychosocial assessment with developmentally appropriate education, supportive family involvement, school collaboration, individualized use of diabetes technology, and access to qualified mental health professionals. Nurses have an important role in recognizing emerging concerns, promoting respectful communication, strengthening coping skills, and coordinating multidisciplinary support.

Further research is needed to evaluate culturally appropriate, practical, and affordable interventions, particularly in resource-constrained settings. Addressing psychological and social needs alongside clinical management may help adolescents with T1DM maintain safer treatment routines, participate more fully in everyday life, and achieve better overall well-being.

DECLARATIONS
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