South American Publishing

SAP Nursing Depths Series. 2026;5:435
doi: 10.62486/nds2026435

REVIEW

Nursing interventions in therapeutic adherence in adolescents with type 1 diabetes: scoping review

Intervenciones de enfermería para mejorar la adherencia terapéutica en adolescentes con diabetes tipo 1: revisión exploratoria

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Submitted: 26-10-2025 | Revised: 22-01-2026 | Accepted: 04-03-2026 | Published: 05-03-2026

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ABSTRACT

Introduction: Type 1 Diabetes is one of the most prevalent chronic diseases in children and adolescents. Adolescence is marked by multiple physical, emotional, and social changes that may compromise therapeutic adherence. This adherence is essential for promoting quality of life and preventing complications. The objective of this review was to map the existing scientific evidence on nursing interventions that facilitate therapeutic adherence in adolescents with Type 1 Diabetes. Methods: The protocol was developed according to the Joanna Briggs Institute guidelines. Searches were conducted in CINAHL Complete, Medline Complete, Portugal's Open Access Scientific Repositories and Google Scholar. Primary and secondary studies, as well as grey literature addressing adolescents with Type 1 Diabetes and nursing interventions that promote therapeutic adherence, were included. Studies describing interventions not carried out by nurses were excluded. Results: Eight studies were included. Structured education, emotional support, use of technology, follow-up (in person or via telemedicine), school-based interventions, and the promotion of peer-sharing spaces were found to be relevant for improving therapeutic adherence. Conclusions: The nurse's intervention, due to their proximity and continuity throughout the therapeutic process, emerges as a key element—not only in the transmission of technical knowledge but also in the psychosocial support that provides safety and autonomy to adolescents with Type 1 Diabetes and their families. Further studies are recommended to explore the effectiveness of the identified interventions across different contexts.

Keywords: Diabetes Mellitus, Type 1; Nursing Care; Adolescent; Treatment Adherence and Compliance.

RESUMEN

Introducción: La diabetes tipo 1 es una de las enfermedades crónicas más frecuentes en niños y adolescentes. La adolescencia se caracteriza por múltiples cambios físicos, emocionales y sociales que pueden comprometer la adherencia al tratamiento. Esta adherencia es esencial para promover la calidad de vida y prevenir complicaciones. El objetivo de esta revisión fue recopilar la evidencia científica existente sobre las intervenciones de enfermería que facilitan la adherencia al tratamiento en adolescentes con diabetes tipo 1. Métodos: El protocolo se desarrolló de acuerdo con las directrices del Instituto Joanna Briggs. Las búsquedas se realizaron en CINAHL Complete, Medline Complete, los repositorios científicos de acceso abierto de Portugal y Google Scholar. Se incluyeron estudios primarios y secundarios, así como literatura gris que abordara a adolescentes con diabetes tipo 1 e intervenciones de enfermería que promovieran la adherencia terapéutica. Se excluyeron los estudios que describían intervenciones no llevadas a cabo por personal de enfermería. Resultados: Se incluyeron ocho estudios. Se determinó que la educación estructurada, el apoyo emocional, el uso de la tecnología, el seguimiento (presencial o mediante telemedicina), las intervenciones en el ámbito escolar y la promoción de espacios de intercambio entre pares eran relevantes para mejorar la adherencia terapéutica. Conclusiones: La intervención del personal de enfermería, debido a su proximidad y continuidad a lo largo del proceso terapéutico, se perfila como un elemento clave, no solo en la transmisión de conocimientos técnicos, sino también en el apoyo psicosocial que proporciona seguridad y autonomía a los adolescentes con diabetes tipo 1 y a sus familias. Se recomiendan estudios adicionales para explorar la eficacia de las intervenciones identificadas en diferentes contextos.

Palabras clave: Diabetes mellitus tipo 1; Cuidados de enfermería; Adolescentes; Adherencia y cumplimiento del tratamiento.

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INTRODUCTION

Type 1 Diabetes Mellitus (T1DM) is characterized by the absence of insulin production by the pancreas, requiring, therefore, the daily administration of this hormone for glycemic control.(1) This pathology can occur at any age; however, it is more prevalent among children and young adults.(2)

Estimates indicate the existence of approximately 1.2 million children and adolescents worldwide with a confirmed diagnosis of T1DM.(2) In Portugal, data from 2014 reported 3,365 children and adolescents with T1DM, representing about 0.16% of the national population.(3) In 2022, the International Diabetes Federation reported 201,000 new cases diagnosed in individuals under 20 years of age, out of 530,000 new cases diagnosed globally.(4)

According to the World Health Organization (WHO), adolescence corresponds to the period between 10 and 19 years of age and constitutes a crucial stage of development during which behavioral patterns related to physical activity, diet, and other lifestyle habits are established.(5)

In addition to these patterns, there is also a process of psychological and cognitive maturation that culminates in a period of physiological and behavioral vulnerability, compromising the management of chronic diseases such as T1DM. Thus, living with T1DM during adolescence represents a significant challenge for both adolescents and their families, requiring complex adaptation at multiple levels.

To ensure effective treatment of T1DM, it is necessary to adopt a set of care practices and precautions, namely self-monitoring (blood glucose control and insulin administration), healthy eating, and regular physical activity.

However, given the multiple changes that characterize adolescence, it is essential to define specific and developmentally appropriate interventions for this life stage. According to these authors, the main barriers to therapeutic adherence include immaturity, impulsivity, and peer influence—factors that hinder metabolic control and increase the risk of complications.

TA implies a set of behavioral changes aimed at ensuring compliance with the prescribed therapeutic regimen, encompassing various aspects such as taking and obtaining medications, adopting healthy lifestyle habits, following an appropriate diet, engaging in regular physical activity, avoiding risky behaviors, and attending follow-up appointments. Other factors are also fundamental for daily self-management, such as communication with healthcare teams and peer support, leading to better health outcomes.

Thus, empowering adolescents for effective management of T1DM becomes essential, as self-care is directly related to therapeutic adherence. Consequently, the early and tailored intervention of healthcare professionals — particularly nurses — plays a key role in the success of therapeutic adherence and in improving the quality of life of adolescents and their families.(7,9) It is noteworthy that nurses are in a privileged position to intervene by providing information, clarifying doubts about the disease and its implications, offering emotional support, and reinforcing the importance of therapeutic adherence.

For the purposes of this review, nursing interventions are defined as all treatments performed by nurses, based on scientific knowledge and clinical judgment, with the aim of improving client outcomes. According to the same authors, these nursing interventions may take the form of direct or indirect care, focusing on the individual, family, and/or community, and may be initiated by nurses, physicians, or other professionals.

Thus, after clarifying the concept of nursing interventions within the scope of this review, it becomes essential to examine how these interventions have been described and applied in the literature, in order to understand their contribution to therapeutic adherence among adolescents with T1DM.

In light of this, despite the recognized importance of these interventions in clinical practice, significant knowledge gaps remain regarding which nursing interventions are most effective, how they are implemented, and their specific impact on adherence. These gaps underscore the importance of systematically mapping existing evidence to identify established practices, variations in implementation, and areas where knowledge is still insufficient.

To substantiate this need, a preliminary search was carried out using specific terms related to the topic under study in the databases Medline Complete (via EBSCOhost), CINAHL Complete (via EBSCOhost), Joanna Briggs Institute (JBI), Open Science Framework (OSF), and Google Scholar. No scoping review was identified that explores the relationship between nursing interventions and therapeutic adherence in adolescents with T1DM. The absence of previously published scoping reviews further reinforces the relevance and timeliness of this study, as it addresses a significant gap in contemporary nursing practice.

Thereby, the present scoping review was conducted with the aim of mapping the existing

scientific evidence on nursing interventions that facilitate therapeutic adherence in this population.

METHODS

This scoping review was conducted according to the JBI recommendations and in accordance with the Preferred Reporting Items for Systematic Reviews – Scoping Reviews (PRISMA-ScR). The protocol was registered in the OSF, with registration Q9GZV, accessible at .

Research Question

Aiming to map the existing scientific evidence regarding nursing interventions that facilitate therapeutic adherence in adolescents with T1DM, the following review question was formulated according to the PCC mnemonic: "What are the nursing interventions that facilitate therapeutic adherence in adolescents with Type 1 Diabetes Mellitus?".

Inclusion Criteria

Eligibility criteria were defined based on the research question, considering Population, Concept, and Context. Thus, this scoping review includes studies whose population consists of adolescents with T1DM, aged 10 to 19 years, according to the WHO. As a concept, nursing interventions that facilitate therapeutic adherence were considered, and articles referring to interventions not performed by nurses or where the nurse's intervention was unclear were excluded. For the purpose of this review and to address the formulated research question, no geographical, cultural, and/or gender restrictions were applied.

Primary studies, secondary studies, and grey literature published in the last five years in English, Portuguese, or Spanish were included.

Search Strategy

In the initially defined protocol, the review planned to include studies published in the last ten years. However, during the study selection process, it was decided to restrict the timeframe to the last five years, aiming to ensure greater currency and relevance of the data given the rapid evolution of the topic under study and considering the limited time for conducting the present review. This change was made before the data extraction phase.

The search strategy was developed considering three phases. During the construction of the protocol for this review, a search was conducted in the CINAHL Complete and Medline Complete databases (via EBSCOhost) to determine the most commonly used keywords in the literature on the topic under study, as well as the descriptors employed. The search strategy for CINAHL Complete was developed by combining the previously determined MeSH/DeCS descriptors such as "Diabetes Mellitus, Type 1", "Program Evaluation", "Health Promotion" "Health Education", "Nursing Care", "Nursing Interventions" with the boolean terms "AND" and "OR".

In the third phase, the search was replicated and adapted for Medline Complete (via EBSCOhost) as well as for the Open Access Scientific Repositories of Portugal (RCAAP) and Google Scholar.

Subsequently, the reference lists of the retrieved studies were also analyzed to identify other relevant sources to consider for inclusion in the review. The searches were conducted between February and March 2025. Detailed research tables can be provided by the authors upon request.

Study Selection

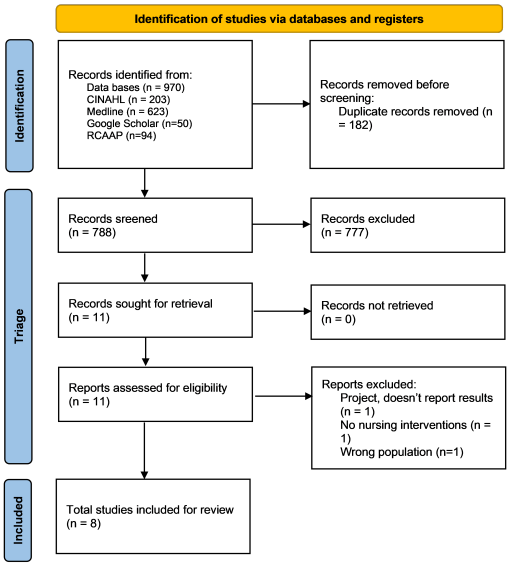
In this process, the online platform Rayyan was used to screen the studies resulting from the search, with duplicates being removed using the same platform.

Subsequently, the two reviewers (AV and MV) independently analyzed the titles and abstracts of the studies in the screening phase to exclude articles that did not meet the defined inclusion criteria. Conflicts were resolved through discussion between the reviewers.

Next, a full-text reading of the studies selected in the previous phase was carried out by the same reviewers. Following this, a pilot test was conducted by the two independent reviewers (AV and MV) to verify the adequacy of the data extraction table, prepared according to the recommendations of Pollock et al. At this stage, articles that did not meet the inclusion criteria were excluded, and the reasons for their exclusion were documented, which included duplicates, not mentioning therapeutic adherence, wrong population and no nursing interventions. Discrepancies between the reviewers were resolved with the intervention of a third reviewer (RSM).

To illustrate the study selection process as described above, Figure 1 presents the PRISMA-ScR Flowchart, according to the recommendations of Page et al.

Figure 1. Prisma-ScR Flowchart.



Source: Own elaboration, according to Page et al.

Data Extraction

Data extraction was carried out using an Excel document by two independent reviewers (AV and MV), using the table designed during the protocol development phase mentioned above. A third reviewer (RSM) was consulted whenever a conflict arose between the first two reviewers. Information was collected to answer the review question, including: authors, study type, country, sample size, results, and study limitations. The completed data extraction table can be provided by the authors upon request.

Data Analysis and Presentation

In addition to filling out the table, a brief narrative synthesis of the obtained results was carried out, which is presented in the next chapter of this scoping review.

The characteristics of the included studies and participants were analyzed quantitatively in a descriptive manner, with the results presented in tables, charts, and narrative summaries.

A basic content analysis was performed to quantitatively analyze the data regarding the definition and characteristics of nursing interventions that facilitate therapeutic adherence, with the results also presented in tables and narrative summaries.(13,15) In the conclusions, identified gaps and suggestions for future research on the topic are presented.

The PRISMA-ScR checklist was completed in accordance with JBI recommendations.

Ethical Approval

This scoping review did not involve research with human participants. However, all ethical and legal principles underlying this type of research were respected, namely respect for the authors' perspectives and rigor in referencing the sources used. The authors declare that all information contained in this review is their own work.

RESULTS

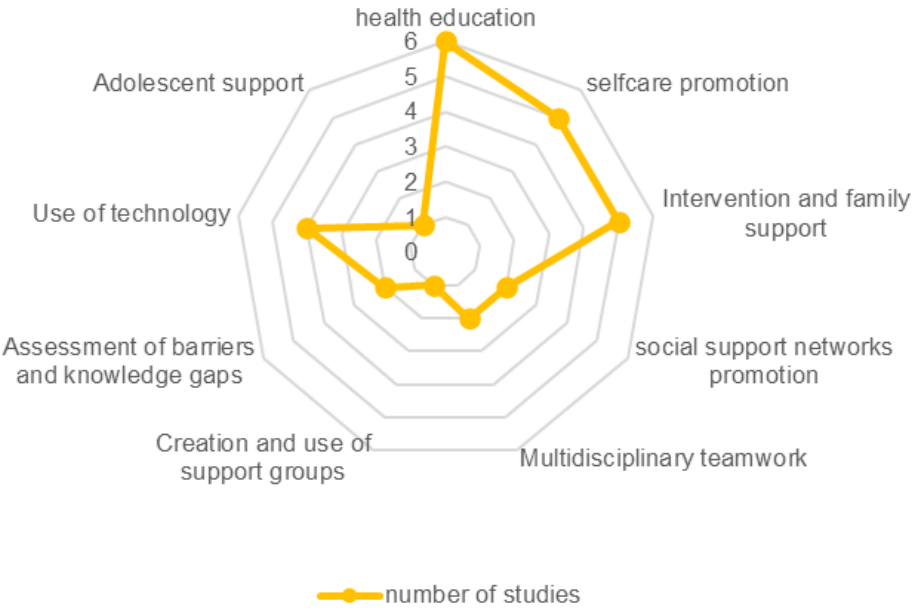
A total of 826 studies were identified through the databases (203 in CINAHL Complete and 623 in Medline Complete), 50 in Google Scholar, and 94 in RCAAP. After screening the titles and abstracts, 644 studies from the databases, 48 studies from Google Scholar, and 91 studies from RCAAP were excluded. Full-text reading of the selected studies was then conducted, during which three additional studies were excluded. Thus, a total of eight studies were selected for inclusion in this review.

The included studies were published in 2024 (one), 2023 (two), 2022 (one), 2021 (one), 2020 (one), and 2019 (two), originating from Israel (one), the United States of America (one), Portugal (one), and literature reviews without specified geographical location (five).

Methodologically, the sample of selected studies consisted of four integrative reviews, one cross-sectional study, one secondary analysis of data from a cross-sectional questionnaire, one review article, and one master's thesis.

Next, in Figure 2, the chart highlights the number of analyzed studies in which nursing interventions facilitating therapeutic adherence in adolescents with T1DM are reported. These interventions were grouped into the following categories: health education; promotion of self-care; family intervention and support; promotion of social support networks; multidisciplinary team work; creation and use of support groups; assessment of knowledge barriers and gaps; adolescent support; and use of technology.

Figure 2. Nursing interventions that facilitate therapeutic adherence in adolescents with Type 1 Diabetes Mellitus mentioned in the analyzed articles, grouped by themes.



Source: Own elaboration.

Through qualitative data analysis, it is possible to identify the nursing interventions that facilitate therapeutic adherence in adolescents with T1DM. The most frequently reported type of nursing intervention was health education, present in six of the included studies. This was followed by promotion of self-care and family intervention and support (five studies) and the use of technology (four studies). In two studies, interventions related to multidisciplinary team work, assessment of knowledge barriers and gaps, and promotion of social support networks were reported. Finally, only one study mentioned adolescent support and the creation and use of support groups.

From this analysis, a summary in tabular form of the interventions reported in the studies was also prepared, which can be consulted in Table 1.

Table 1. Summary of the nursing interventions identified per analyzed study.

TITLE (YEAR, Country)	STUDY TYPE	IDENTIFIED NURSING INTERVENTIONS
Diabetes Mellitus Tipo 1 na Adolescência: Adesão ao Tratamento e Qualidade de Vida (2024, NA)	Integrative Review	Identify beliefs that lead to disease denial Support the adolescent in facing challenges Consider family dynamics Professional follow-up directed at the family Specialized interdisciplinary team
A contribuição da consulta de enfermagem frente aos fatores psicossociais relacionados à adesão ao tratamento de insulinoterapia (2021, NA)	Integrative Review	Health education Teaching about warning signs and symptoms of worsening Formation of support groups Encourage sharing experiences among peers Promote education and training for safe and effective insulin administration Encourage family and patient's social circle to provide necessary support for good practices
Desafios Para O Autocuidado De Adolescentes Portadores De Diabetes Mellitus Tipo 1 - Revisão Integrativa (2020, NA)	Integrative Review	Health education that facilitates behavioral changes Guide the adolescent and family regarding self-care capacity to improve treatment success and quality of life Promote health promotion actions in adolescents' family units Identify knowledge gaps to clarify and provide guidance
O Enfermeiro Especialista como Promotor da Adesão do Adolescente com Diabetes Mellitus tipo 1 ao Regime Terapêutico (2019, Portugal)	Master's Thesis	Use technology as a tool to improve communication with adolescents Assist in self-monitoring and management of the chronic disease Assist in therapy optimization and promotion of self-management
Adherence to diabetes care: knowledge of biochemical processes has a high impact on glycemic control among adolescents with type 1 diabetes (2019, Israel)	Cross-Sectional Study	Include explanations about the biochemical-causal functioning of the disease in education and training programs Explain "what happens" and "why," not just therapeutic regimen management Assess knowledge gaps about the biochemical-causal functioning of the disease to incorporate these topics into health education
Insulin adherence in adolescents with type 1 diabetes mellitus (2023, NA)	Review Article	Assess educational, behavioral, emotional, and psychosocial factors affecting the implementation of the treatment plan, working with the adolescent and family to overcome barriers and redefine goals as needed Include behavioral and psychological strategies in health education Support children and adolescents with T1DM in accepting and participating in self-care Promote conditions for T1DM management in schools Provide appropriate "treats" so adolescents do not feel excluded Assist in peer education about T1DM
Therapeutic nursing education in promoting self-management of adolescents with type 1 diabetes mellitus: integrative literature review (2023, NA)	Integrative Review	Use face-to-face sessions as well as telephone contacts with adolescents Encourage parental participation in promoting adolescents' autonomy Use motivational interviews to promote treatment adherence
Predicting optimal use of continuous glucose monitors in adolescents with type 1 diabetes: it's about benefit and burden (2022, United States)	Secondary Analysis of Cross-Sectional Questionnaire	Use education, problem-solving, and goal-setting to promote adherence to continuous glucose monitoring devices

Source: Own elaboration.

DISCUSSION

The results highlight the importance of therapeutic adherence for the control of T1DM and, consequently, an improvement in quality of life for adolescents.(17,18,19,20)

Nurses are considered essential in the health promotion process among adolescents. (17,18,20,21) They are present from the time of diagnosis and can, together with adolescents and their families, clarify what the treatment entails, identify knowledge gaps and also understand the feelings inherent to the transition process of both the patient and the family, thus enabling targeted and qualified intervention.(18,20,22,23)

In this way, the nurse's intervention involves empowering adolescents for self-management of the chronic disease and teaching the recognition of signs and symptoms inherent to T1DM that may indicate critical situations.(17,20) Dabas et al. and Matos further emphasize the importance of defining priorities with the adolescent, planning achievable goals, and promoting communication about the needs they feel.(21,23) Knowledge related to T1DM provides a sense of security, which consequently can improve treatment adherence.(17,20)

Some authors argue that factors influencing adolescents' self-care should be considered so that they can be addressed to promote adherence, thus reducing the risk of acute and chronic complications.(20, 22, 23)

Education about the causal process of the disease, such as its pathophysiology and biochemistry, also emerges as an intervention that helps adolescents with T1DM understand the disease, consolidating information for informed decision-making. This approach is also mentioned as a method that can motivate adolescents to implement changes in their lifestyle and behavior.

Poor metabolic control increases the risk of complications, making the identification of strategies that promote therapeutic adherence essential. Thus, some strategies are mentioned in the studies—technology is cited by Matos as a communication strategy with adolescents, as they are a population that uses technology with more ease.

Over the years, other types of technology related to diabetes have increased. One example that has revolutionized glucose monitoring and control is continuous glucose monitoring sensors (CGMS), which Messer et al. refer to as an important strategy for disease self-management, in which nurses play a significant role by providing support in the use of CGMS and interpretation of its results. The same authors refer to the use of CGMS as first-line therapy, making it essential for nurses to educate adolescents on its use.

Group therapy is also considered beneficial for adolescents, as sharing feelings, doubts, experiences, and concerns among adolescents with T1DM enhances their therapeutic adherence, as they can take their peers as examples.(17,18)

Cunha et al. tested teleconsultation as an intervention to promote self-care and reported better results compared to conventional follow-up with adolescents. Pereira et al. report using both methods—face-to-face and teleconsultation—which showed good results, notably in lowering glycated hemoglobin levels. That is, close and continuous follow-up by nurses becomes significant for adolescent adherence and improvement of T1DM-related outcomes.

Equally important, intervention in the school setting, where adolescents spend most of their time, should be a focus for nurses. These authors emphasize the need for safe places for adolescents to check their glucose and administer insulin, the availability of appropriate foods and treats so they do not feel excluded, and peer education about T1DM.

However, some challenges for healthcare professionals are described, namely that T1DM is a chronic disease requiring daily and continuous treatment, which needs to be adjusted to the characteristics of each adolescent. This author also mentions the promotion of skills that allow greater independence and autonomy for adolescents with T1DM as a challenge. Furthermore, adaptation to each family and the social context in which they are inserted is necessary.

Effective control of T1DM, along with proper management of therapy, nutrition, and physical activity, can help adolescents develop into healthy adults and reduce the risk of complications associated with the disease.

Thus, the nurse's intervention is fundamental for improving T1DM control and self-management, promoting healthy lifestyles and daily habits, which results in reduced complications and consequent hospitalizations with numerous associated costs.(19, 21, 23)

CONCLUSIONS

Following the completion of this scoping review, it was possible to map and analyze the existing scientific evidence on the topic under study and answer the review question, identifying the interventions performed by nurses that can facilitate therapeutic adherence in adolescents with T1DM, revealing the complexity and specificity required at this stage of development. Strategies such as structured disease education, emotional support, the use of technology (such as CGMS), face-to-face and telemedicine consultations, school-based interventions, and the promotion of peer-sharing spaces were found to be relevant for fostering self-management and, consequently, improving therapeutic adherence.

The nurse's intervention, due to their proximity and continuity throughout the therapeutic process, emerges as a key element, not only in the transmission of technical knowledge but also in providing psychosocial support that ensures security and autonomy for both the adolescent and the family. This review thus contributes to reinforcing the importance of nursing in promoting individualized, proactive, and evidence-based care, with a positive impact on health outcomes.

Contributions to Nursing Practice

The results of this review demonstrate the importance of nurses in health education for adolescents, aimed at improving therapeutic adherence in the context of T1DM. Given that the prevalence of T1DM has increased in recent years, as shown by national and international data, it

is a priority to develop strategies for disease control and establish nurses as key agents in health promotion and in reducing acute and chronic complications.

As future specialist nurses in Community and Public Health, we recognize the relevance of our intervention with adolescents with T1DM, mobilizing skills such as promoting health literacy, coordinating with community structures, and empowering adolescents for self-care, as defined by Regulation No. 428/2018 of the Portuguese Nursing Association.(25) Our practice should be positioned as a promoter of therapeutic adherence, person-centered, and taking into account the social and community context.

Study Limitations

The topic under study is widely addressed in the literature but covers different populations, with few sources focusing exclusively on adolescents. This means that many excluded studies, for not meeting the inclusion criteria, may present important results relevant to the research question. Additionally, factors such as the selected languages (Portuguese, English, and Spanish), the established five-year timeframe, the methodological heterogeneity of the included studies, and the limited time available for this review may have affected the comprehensiveness of the results.

Suggestions for future research

Based on the obtained results, it is recommended to conduct future studies exploring the longitudinal effectiveness of the identified interventions, as well as research focused on community nursing interventions, in family, school, and community contexts, integrating adolescents' perspectives. Research on the use of emerging technologies, namely mobile applications and artificial intelligence, may also open new possibilities for supporting therapeutic adherence in this specific population.

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FUNDING

No financing

CONFLICT OF INTEREST

None

AUTHORSHIP CONTRIBUTIONS

Conceptualization: Mariana Vala, Ana Vicente
Data curation: Mariana Vala, Ana Vicente
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SUPLEMENTARY MATERIAL

Table 1. CINAHL Complete Search Strategy and Results – via EBSCOhost

#	Search terms	Results
S1	TI (“adolescen*” OR “teen*” OR “youth*” OR “young*”)	248 339
S2	AB (“adolescen*” OR “teen*” OR “youth*” OR “young*”)	354 557
S3	S1 OR S2	461 160
S4	TI (“diabetes” OR “diabetes mellitus, type 1” OR “T1DM” OR “DM1” OR “type 1 diabetes”)	132 815
S5	AB (“diabetes” OR “diabetes mellitus, type 1” OR “T1DM” OR “DM1” OR “type 1 diabetes”)	156 645
S6	MH (“diabetes mellitus, type 1”)	29 466
S7	S4 OR S5 OR S6	169 485
S8	TI (“intervention*” OR “facilitat*” OR “encourag*” OR ”program*” OR “strateg*” OR ”project*” OR “action*” OR “function*” OR “care*” OR “preparation” OR “education” OR “instruction*” OR “train*” OR “nurse facilitated”)	1 236 454
S9	AB (“intervention*” OR “facilitat*” OR “encourag*” OR ”program*” OR “strateg*” OR ”project*” OR “action*” OR “function*” OR “care*” OR “preparation” OR “education” OR “instruction*” OR “train*” OR “nurse facilitated”)	2 253 208
S10	MH (“health promotion” OR “Health Education” OR “Nursing care” OR “Nursing interventions”)	96 584
S11	S8 OR S9 OR S10	2 917 510
S12	TI (“Patient adherence” OR “Treatment compliance” OR “Therapeutic Adherence” OR “Therapeutic Regimen” OR “Adherence”)	23 491
S13	AB (“Patient adherence” OR “Treatment compliance” OR “Therapeutic Adherence” OR “Therapeutic Regimen” OR “Adherence”)	60 358
S14	S12 OR S13	69 512
S15	S3 AND S7 AND S11 AND S14	588
S16	Search limiters: Publication dates - 2019-2025 Restrict by language - Portuguese Restrict by language - English Restrict by language – Spanish Search modes - Boolean/Sentence	203

Note: S=Search; Source: Own elaboration.

Table 2. Medline Complete Search Strategy and Results – via EBSCOhost

#	Search terms	Results
S1	TI “adolescen*” OR “teen*” OR “youth*” OR “young*”	699 606
S2	AB (“adolescen*” OR “teen*” OR “youth*” OR “young*”)	386 592
S3	MH (Adolescent OR Young OR Teen)	351 715
S4	S1 OR S2 OR S3	802 720
S5	TI (“diabetes” OR “diabetes mellitus, type 1” OR “T1DM” OR “DM1” OR “type 1 diabetes”)	309 236
S6	AB (“diabetes” OR “diabetes mellitus, type 1” OR “T1DM” OR “DM1” OR “type 1 diabetes”)	635 641
S7	MH (“Diabetes Mellitus, Type 1” OR “Diabetes, Type 1” OR “Type 1 Diabetes”)	90 191
S8	S5 OR S6 OR S7	735 802
S9	TI (“intervention*” OR “facilitat*” OR “encourag*” OR ”program*” OR “strateg*” OR ”project*” OR “action*” OR “function*” OR “care*” OR “preparation” OR “education” OR “instruction*” OR “train*” OR “nurse facilitated”)	3 044 261
S10	AB (“intervention*” OR “facilitat*” OR “encourag*” OR ”program*” OR “strateg*” OR ”project*” OR “action*” OR “function*” OR “care*” OR “preparation” OR “education” OR “instruction*” OR “train*” OR “nurse facilitated”)	10 879 508
S11	MH (“health promotion” OR “Health Education” OR “Nursing care” OR “Nursing interventions”)	84 776
S12	S9 OR S10 OR S11	11 995 035
S13	TI (“Patient adherence” OR “Treatment compliance” OR “Therapeutic Adherence” OR “Therapeutic Regimen” OR “Adherence”)	46 118
S14	AB (“Patient adherence” OR “Treatment compliance” OR “Therapeutic Adherence” OR “Therapeutic Regimen” OR “Adherence”)	192 929
S15	MH (“Treatment Adherence and Compliance”)	1153
S16	S13 OR S14 OR S15	201 630
S17	S4 AND S8 AND S12 AND S16	728
S18	Search limiters: Publication dates - 2019-2025 Restrict by language - Portuguese Restrict by language - English Restrict by language – Spanish Search modes - Boolean/Sentence	623

Note: S=Search; Source: Own elaboration.

Repositórios Científicos de Acesso Aberto de Portugal Search:
Search by subject with the terms “nurs*” AND “adolesc*” AND “diabet*”, total of 94 articles.

Google Scholar Search:
Search by title “Adolescent with Diabetes Mellitus type 1” and “Adesão terapêutica nos adolescentes com Diabetes Mellitus tipo 1”, total of 50 articles.