

Current Scientific Evidence on the Impact of Type 1 Diabetes in Childhood

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Abstract

Introduction: Managing Type 1 Diabetes goes beyond glycemic control and requires interdisciplinary care to enable patients to self-manage their disease, prevent acute decompensation, and reduce the risk of chronic complications. It has a significant impact on patients' lifestyles and self-esteem. The way in which this disease is managed is influenced by both a person's psychological characteristics and their social relationships.

Objectives: To analyze the current scientific evidence on the impact of type 1 diabetes in children.

Materials and Method: Design: Systematic review in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Guidelines. Procedure: The information was synthesized and analyzed by a panel of experts, and the evidence published to date was collected: from 2018 to March 2025. Languages: Spanish, English. Cumulative search in the evidence-based medicine databases EBM, PubMed, and Embase.

Results: Of 434 evidences analyzed (295 in PubMed), 21 articles (17 key articles) were selected. After reviewing the 17 selected articles, four thematic categories emerged: Susceptibility to environmental factors, Pediatric age: significant increase in its global incidence, new challenges: Psychosocial factors and T1D, and Current quality of life in T1D.

Conclusions: Patients with T1D are at risk for anxiety, life stress, and clinical depression. An inverse relationship has been found between TD self-management and the presence of psychological complications.

Keywords: (MeSH): Diabetes Type 1, Evidence, Nursing Care, Childhood.

Introduction

Type 1 diabetes (T1D, juvenile or childhood-onset diabetes) is a chronic autoimmune disease caused by irreversible dysfunction of the pancreatic beta cells. It is characterized by insufficient insulin production and requires daily insulin administration. The cause is still unknown, and it cannot be prevented with current knowledge. Its symptoms excessive urination (polyuria), thirst (polydipsia), hunger (polyphagia), weight loss, visual disturbances, and fatigue can appear suddenly [1,2].

The lack of glucose in the tissues triggers a compensatory response from cells to obtain fuel from fats, with an increase in counterregulatory hormones (cortisol, glucagon, epinephrine, growth hormone), leading to the production of ketone bodies (acetoacetate, S-hydroxybutyrate, and acetone) in the cellular mitochondria. This situation can worsen, leading to an accelerated catabolic state with a venous pH below 7.3 mmol/L, triggering decompensation due to diabetic ketoacidosis (DKA). The cardinal symptoms, which originate in a state of sustained hyperglycemia,

are not always evident to the general population. There are still many cases in which individuals detect these symptoms late and arrive at the emergency department in a state of DKA decompensation [3-4].

The management of T1D is complex, going beyond glycemic control and requiring interdisciplinary care: continuous medical attention and educational support so that patients can self-manage their disease, prevent acute decompensations (hypo/hyperglycemia), and reduce the risk of chronic complications [5-9]. T1D has a significant impact on patients' lifestyles, as well as on their self-esteem. The way in which this disease is faced is influenced by both the psychological characteristics of the person and their social relationships. Patients with T1D and their families and caregivers, through contact and involvement with different community support groups, can obtain information to cope with the needs and problems that may arise throughout the course of the disease [6-12].

In the NICE Clinical Practice Guideline, evidence comes from observational studies such as the DAWN55 study, which indicates that emotional support, along with family support, are key factors in diabetes management, and that social networks are considered at least as important as medication for managing the disease [13].

On the other hand, nursing care is based, from its very definition, on the communication and relationship established between nursing staff and patients, since nursing practice addresses their needs. Communication becomes the essential element of care for understanding these needs and acting accordingly. Therapeutic education of the patient, their family members, or caregivers, understood as a person-centered process that encompasses their needs, resources, values, and strategies, and is guided by evidence-based care, allows patients to improve their knowledge and skills related to their disease and treatment. It is important to consider that more than 90% of the decisions that influence outcomes must be made by the patient themselves. Therefore, there is a need to acquire the knowledge, skills, and attitudes necessary for the effective self-management of diabetes.

At the level of professional competencies, the role of the diabetes nurse specialist is defined by the "expert role," whose key components are identified in the literature as expert or high-level practice, characterized by the following roles:

Educator role for patients, families, other professionals, and the general public; Consultant role; Research role as principal or associate investigator in educational topics; Managerial or administrative role (administrative and financial management of educational program planning, as well as identifying gaps in diabetes care services); Collaborator, communicator, or liaison role; Innovator role: detecting and assessing needs for change, identifying new approaches to care, and collaborating in implementing new care models.

The Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) [7]. group demonstrated that the reduction of complications in the early stages during DCCT resulted in substantial reductions in serious complications and cardiovascular disease. This effect was termed metabolic memory. In adolescents with T1D, after four years of follow-up, the improvement in HbA1c associated with intensive therapy showed benefits in terms of reducing microvascular complications and their progression, even if this improvement had not been achieved after the diabetes diagnosis. On the other hand, it has been described that people with type 1 diabetes have a higher risk of mortality than people without diabetes [8]. Thus, it was observed that patients with HbA1c below 6.9% had a higher risk of mortality than the population without diabetes, with a hazard ratio of 2.38.

The evidence-based approach to children's rights to grow up in a safe environment, as affirmed in numerous human rights documents such as the Convention on the Rights of the Child (CRC), the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), and the Convention on the Rights of the Child (CRPD), incorporates the latest neuroscience research. Evidence demonstrates that risk factors are cumulative, interrelated, and have a greater impact in the early years, with long-term consequences. These factors represent the main challenge to address in order to achieve optimal therapeutic management, and are associated with the persistence of long-term hyperglycemia.

Thus, this Study Aims to Answer the Question:

What scientific evidence exists regarding the impact of type 1 diabetes in children diagnosed with this disease?

Objectives: To analyze the current scientific evidence on the impact of type 1 diabetes in children with this disease.

Materials and Methods

Design: Systematic review conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, 2020 revision.

Identification of the Guiding Question: This was formulated using the CPC (Concept, Population, and Context) format. The following were considered: C (impact of type 1 diabetes), P (child population), and C (current society). The guiding question was established as: What scientific evidence exists regarding the impact of type 1 diabetes on children diagnosed with this disease?

Selection Criteria (Figure 1):

Inclusion: Evidence published in the last seven years (2018–2025), full text in Spanish, available in the following open databases: MEDLINE (PubMed) and EMBASE (Elsevier). The information was located during March 2025. A cumulative search was also conducted in evidence-based medicine (EBM) databases and databases of international organizations:

- Tripdatabase (European, American, and British guidelines).
- NeLH (UK National Health Library Guideline Locator).
- Canadian Medical Association.
- Clinical Practice Guidelines in the National Health System.

Exclusion: Due to the high prevalence of type 1 diabetes (T1D) in childhood, articles based on diabetes in the adult population and duplicates in the databases were excluded.

Systematic Literature Search: (DeCS): Type 1 Diabetes, evidence, nursing care, childhood and their corresponding Medical Subject Headings (MeSH): diabetes type 1, evidence, nursing care, childhood. The Boolean operator "AND" was used, which allowed for broadening the search criteria and better filtering of the information.

Selection of Studies Applying Inclusion/Exclusion Criteria:

An initial search was conducted to identify all studies matching the selected descriptors in the databases. Duplicates and studies in languages other than Spanish/English were removed. Subsequently, an independent panel of experts performed the screening by applying the exclusion criteria. The titles and abstracts of the preselected studies were reviewed to verify their relevance to the topic and to eliminate irrelevant studies. The flowchart for the database search systematization was developed according to the PRISMA-2020 methodology.

Data Extraction from the Studies: To extract the data relevant to the review, the full text was read. This process was carried out manually and independently by the authors of the research. Subsequently, the selected key articles (title, abstract, and available full text) were transferred to the Mendeley Reference Manager platform, and duplicates were removed (PRICE).

Study Variables: Data were recorded for the following variables: sample size and selection method, country where the study was conducted, year of publication, database where it was located, and evidence (family functioning, the associated factor or condition,

and the type of relationship found between the variables).

Assessment of Individual Biases and Study Quality: To assess the risk of bias in each included article, the STROBE statement (32 items) was applied to quantitative studies and the COREQ checklist (22 items) to qualitative studies. Articles scoring below 80% were excluded, resulting in the final articles included for review. This entire process of identifying, selecting, and assessing article eligibility was carried out using the Preferred Reporting

Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol. Both researchers independently assessed all articles (peer review), and the results were then verified, reaching a consensus. Furthermore, to ensure the quality of the review study, the checklist proposed in the PRISMA methodology was followed [14,15].

Inclusión criteria	Exclusion criteria
- Articles published from 2018 to 2025. - Language: English and Spanish. - Articles studying type 1 diabetes (T1D) in children (0-18 years).	- Expert opinion articles with very low levels of evidence and/or recommendation. - Articles whose main topic does not include childhood. - Articles that do not have access to the full text.

Figure 1: Inclusion/Exclusion Criteria.

Ethical Considerations

The study databases have been electronically protected with codes that have limited access to project researchers only. Except in emergency situations, no changes or deviations from the protocol have been permitted without documented approval.

Results

Of the 434 pieces of evidence analyzed (295 in PubMed), 21 were selected (17 key articles). After review, analysis, and synthesis, four thematic categories emerged: Susceptibility to environmental factors, Pediatric age: significant increase in its global incidence, new challenges: Psychosocial factors and T1D, and current quality of life in T1D (Table 1).

S.NO	Author/ Title / Year of Publication / Country / Database / (n) Evidence
1	SENCE Study Group "Strategies to Improve the Use of the New CGM in Early Childhood." Randomized clinical trial evaluating the use of continuous glucose monitoring (CGM) with standardized education, with or without family behavioral intervention, compared to fingerstick glucose monitoring in very young children with type 1 diabetes. Diabetes Care. 2021. PubMed [16].
2	The Role of Nurses in Taking Care of Children with Type 1 Diabetes. 2022. PubMed. Nurses who are specialists in pediatric diabetes play a fundamental role in the diagnosis, management, and treatment of type 1 diabetes [17].
3	Self-care activities in pediatric patients with type 1 diabetes mellitus. 2024. PubMed. Evaluate the differences in adherence to self-care activities with respect to sociodemographic and clinical characteristics in pediatric patients with type 1 diabetes (T1D) [18].
4	Type 1 Diabetes Mellitus in Pediatric Patients and Its Impact on Relationships in the Family Environment. 2020. PubMed. Evaluate the impact of T1D on relationships within the family environment: It impacts the family environment and the relationship with parents. The most prevalent feelings described were fear, worry, and insecurity [19].
5	Type 1 Diabetes in Children and Adolescents: A Position Statement by the American Diabetes Association. 2018. PubMed. Analyze the position statement of the American Diabetes Association: Care of children and adolescents with T1D: Increased understanding of the disease is enabling advances in treatment. However, the treatment of T1D in young people still requires constant monitoring and intervention in behaviors [20].

6	Psychosocial impact of type 1 diabetes mellitus in children, adolescents, and their families. Literature review. 2018. PubMed. Adolescents with type 1 diabetes must assume certain responsibilities in managing their disease, but always with the support of their family, in order to achieve a successful transition to adult care. Self-management creates psychosocial problems such as anxiety and depression in children, while parents experience a state of shock at the onset of diabetes. These problems should be addressed by a multidisciplinary team from the moment of diagnosis [21].
7	Diabetic onset in pediatrics: Therapeutic approach from the perspective of nursing. Cantabria. 2021 (n=34): Literature review: The most effective and up-to-date therapeutic approach aimed at the care of pediatric patients at diabetic onset [22].
8	Impact on the quality of life of adolescents with type 1 diabetes. Rev Chil Pediatr. 2020. The biopsychosocial changes in these individuals can affect their quality of life [23].
9	Type 1 diabetes situation in Andalusia. An Pediatr 2018. PubMed. The most recent study was published in 2018, which included 29 Andalusian hospitals providing an estimated coverage of 2,547 patients. In children under 14 years of age, the minimum incidence was 23.5/100,000 and the minimum prevalence was 1.7/1,000 [24].
10	Does family-centered education improve treatment adherence, glycated hemoglobin, and blood glucose levels in patients with type 1 diabetes? Randomized clinical trial. Nurs Open. Apr. 2023. PubMed [25].
11	Diabetic onset in pediatrics: Epidemiology and factors influencing metabolic control of the disease. Valladolid. 2018. Embase [26].
12	Health Professionals' Experiences Supporting People with Type 1 Diabetes Mellitus Who Deliberately Restrict and/or Omit Insulin for Weight, Shape, and/or Appearance: A Meta-synthesis. BPsychSc. 2023: 1-12. Canadian J Diabetes. PubMed/Embase [27].
13	Challenging diabetes mellitus-related stigma with targeted education. Nursing Standard. 2024. doi: 10.7748/ns.e1240-4 PubMed/Embase [28].
14	Study of Direct Costs, Quality of Life, and Treatment Adherence in Patients Aged 2 to 16 Years with Type 1 Diabetes in Andalusia. 2020. PubMed/Embase [29].
15	Health-related quality of life of adolescents with type 1 diabetes in the context of resilience. Pediatr Diabetes. 2018. PubMed. Multicenter quantitative correlational study to evaluate the quality of life of 229 adolescents with type 1 diabetes from a behavioral perspective, finding a significant association between quality of life and resilience [30].
16	2018. 1. PubMed/Embase. Systematic review and meta-analysis: They report that emotional and school health domains are affected much more than physical health; an emotional state associated with higher levels of stress generates higher levels of cortisol, which interfere with insulin metabolism and, consequently, with metabolic control [31].
17	"Influence of socioeconomic factors on glycemic control, therapeutic adherence, and quality of life." 2024. (n=323) PubMed/Embase [32].
18	Insulin pump therapy in children with type 1 diabetes: analysis of data from the SWEET registry. Pediatr Diabetes. 2024. PubMed [33].
19	Trying to be like everyone else: PubMed/RESEARCHGATE. A qualitative view of the daily lives of families with adolescents with type 1 diabetes. It reveals the importance of social contexts and representations of the disease among adolescents with type 1 diabetes and their parents [34].
20	Development and psychometric evaluation of the Type 1 Diabetes Mellitus Self-Management Scale for Parents. European Journal of Pediatrics. 2024. Methodological, correlational, and cross-sectional study with a sample of 190 parents of children with type 1 diabetes mellitus. Five experts reviewed the scale items to ensure they adequately covered parents' assessments of their children's diabetes self-management. PubMed/Embase [35].
21	Experiences with a Type 1 Diabetes Diagnosis in Children, Adolescents, and Their Families. 2024. PubMed. Qualitative [36].

Table 1: Diabetes and Enfermería and Infancia (Diabetes and Nursing and Childhood).
Pubmed: 295 results; Filter: 5 years (2018-2025) / Full Text Free.
(Diabetes and Childhood and Evidence).

Evaluation of Methodological Quality

According to the STROBE guide applied for the evaluation of the studies included in the review, none were discarded due to limitations in their internal validity; however, heterogeneity was found in the presentation of the information (Table 2).

Compliance (%) Abstract	SENCE. 100%	Dai H. et al. 100%	Smudja M. et al. 100%	Madrigal MA. et al. 100%	Chiang JL et al. 100%	Henríquez Tejo R et al. 100%	Núñez Cardemil 100%	Lizama F. et al. 100%	López Sigüero. et al. 100%
Introduction	100%	100%	100%	90%	100%	90%	100%	100%	100%
Methodology	99%	100%	100%	100%	100%	100%	100%	100%	100%
Results	90%	90%	80%	80%	80%	80%	80%	80%	99%
Discussion	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 2: Description of the Degree of Compliance with the STROBE Guide Criteria.

Susceptibility to Environmental Factors

T1D is a highly complex autoimmune disease in which not only genetics plays a role, but susceptibility to environmental factors has been linked to the development of this disease, such as cesarean delivery, vitamin D deficiency, early exposure to cow's milk proteins, and the increased incidence of childhood obesity, while breast milk has been postulated as a protective factor [1-7,14,37,38].

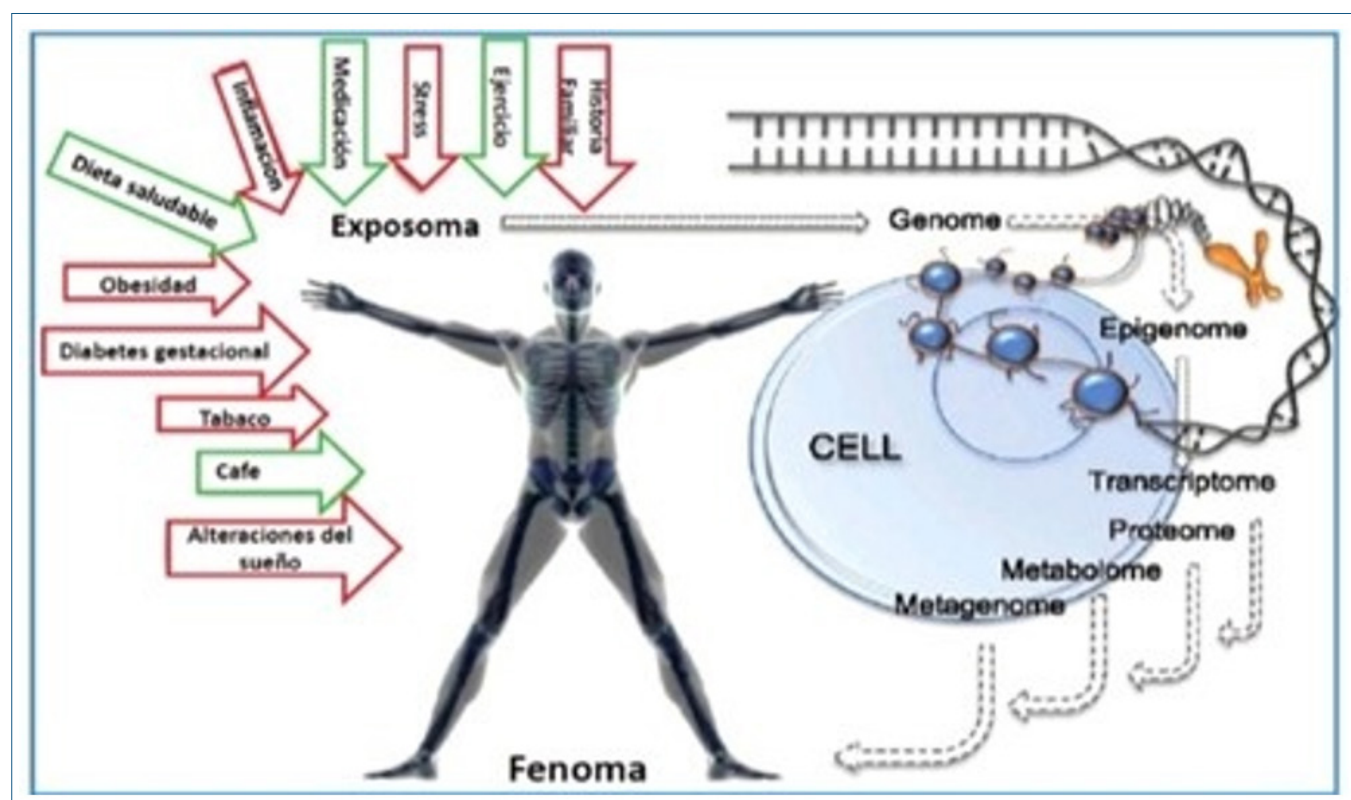


Figure 2: EXPOSOME. Modified from Franks PW et al. Diabetes Care 2013; 36(5).

Factors Investigated:

- **Dietary Factors:** short duration of breastfeeding, early introduction of cow's milk or gluten, a current point of contention. High concentrations of immunoglobulin G against cow's milk pro-teins and frequency of cow's milk consumption are associated with the development of islet cell autoimmunity and type 1 diabetes: the Assay to Reduce Insulin-Dependent Diabetes Mellitus (IDDM) in Genetic Risk Study (TRIGR). (Figure 3)

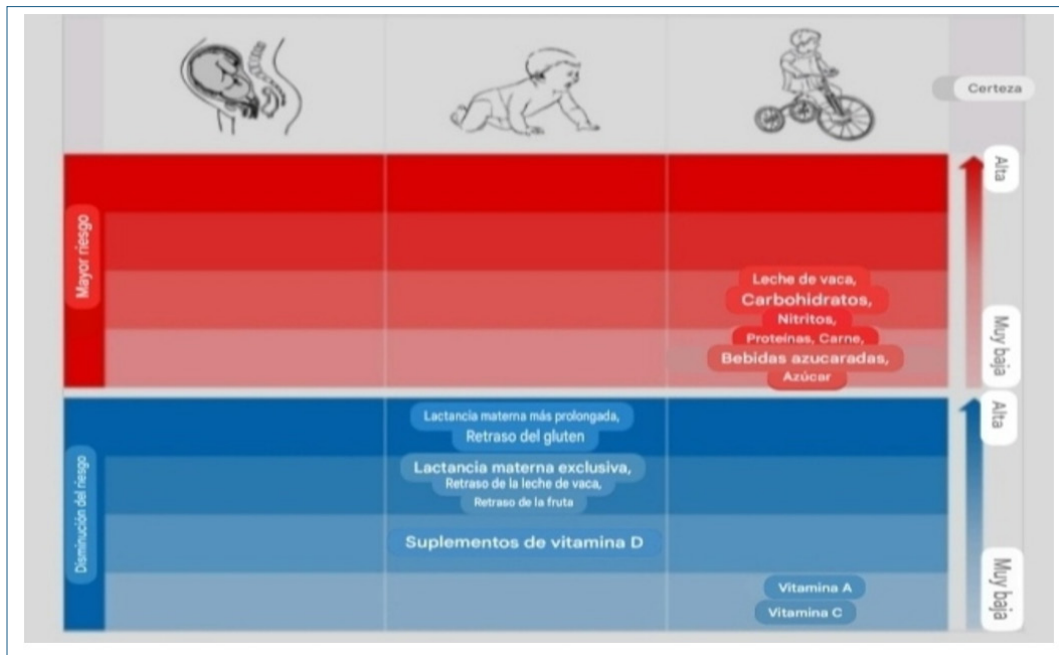


Figure 3: Certainty of Evidence for the Associations Between Dietary Factors at Different Developmental Stages and the Incidence of Type 1 Diabetes, according to the GRADE tool [39].

- **Obesity:** Obesity is associated with an earlier age of onset of type 1 diabetes (T1D), at which point destruction progresses more rapidly because beta cells are damaged by the metabolic stress they undergo.
- **Season of Birth:** This may be related to sun exposure, temperature, and vitamin D production, which has a relationship with the pathogenesis of T1D that is not yet confirmed.
- **Toxins:** High concentrations of nitrates, nitrites, and nitrosamines have been associated with T1D in both food and water.
- **Viral Infections:** The "Hygiene Hypothesis" concludes that industrialization has modified our lifestyles, decreasing the rate of infections.
- **Stress:** Bidirectional Relationship (Figure 4).

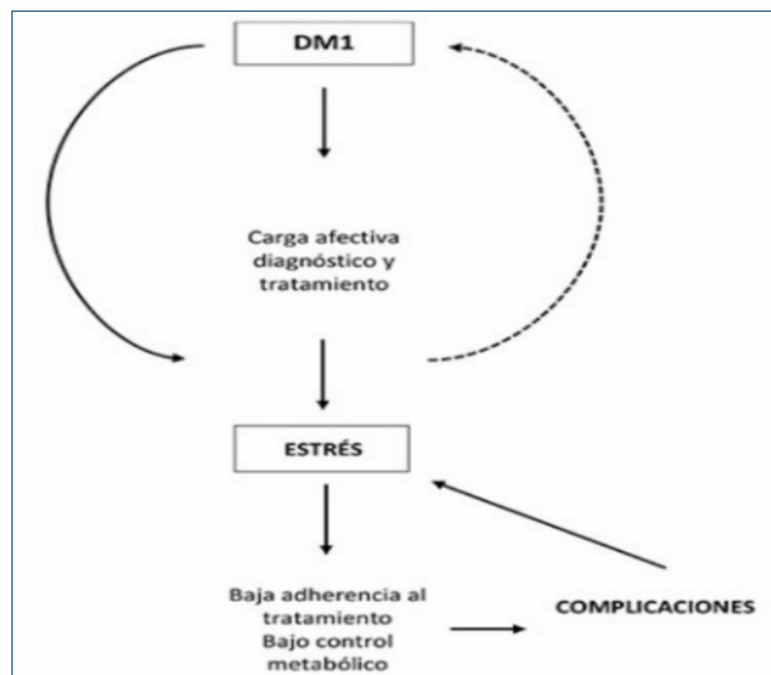


Figure 4: Bidirectional Relationship Between Diabetes (T1D) and Stress.

Pediatric Age: Significant Increase in its Global Incidence (Spain)

In recent years, a notable increase has been observed in the number of patients diagnosed with T1D, as well as a decrease in the average age at diagnosis. Although its incidence remains highest during puberty, the number of onsets in children under 6 years of age has increased. In Spain, epidemiological studies of T1D have been carried out in almost all autonomous communities to collect updated data on the incidence and prevalence of diabetes mellitus in children under 15 years of age [3,6,14,37,40-46].

The first prospective epidemiological studies conducted in Andalusia observed an increase in incidence over the last 5 years. The most recent study was published in 2018, which included 29 Andalusian hospitals providing an estimated coverage of 2,547

patients. We can observe that T1D in childhood shows a significant increase in incidence and prevalence both in Spain and in other European countries, being higher in Andalusia than in the rest of the autonomous communities.

All of this establishes diabetes as a public health issue affecting large segments of the population, requiring comprehensive, multidisciplinary, and coordinated care, both at the primary and specialized care levels. This care must be able to guarantee the effectiveness of interventions through a correct therapeutic approach, in which it will be essential that individualized treatments and care are accompanied by diabetes education focused on the basic pillars of diabetes management: exercise, diet, and medication, an aspect in which nursing will play a fundamental role [4,5].

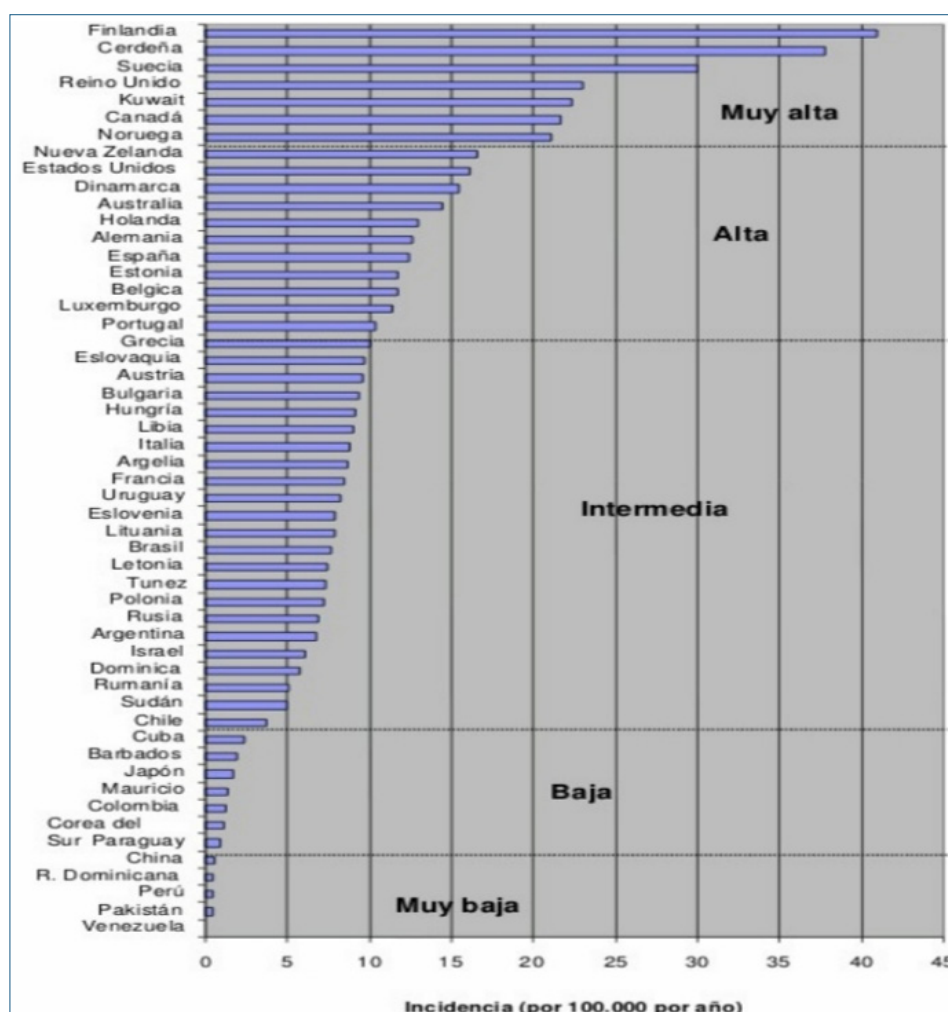


Figure 5: Incidence of Type 1 Diabetes in Children Under 15 Years of Age.

New Challenges: Psychosocial Factors and Type 1 Diabetes

A study revealed that patients who discontinued treatment within the following six months presented a higher HbA1c level, despite no significant differences at the beginning of the study, and also presented higher scores on aggression scales than those who did not discontinue. It is stated that a stable personality and adequate self-esteem would enhance therapeutic adherence. Conversely, poor impulse control, neuroticism, egocentrism, and a hostile attitude toward the medical team would hinder adequate therapeutic adherence. The adolescent stage is particularly affected, as it involves a transitional phase between childhood and adulthood and is “characterized by profound biological, psychological, and social transformations, many of which generate crises, conflicts, and contradictions.” Both aspects, the pathology and the biopsychosocial changes experienced by these individuals, can impact their quality of life, which has been defined by the World Health Organization (WHO) as “an individual’s perception of their position in

life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns [3,40,41].”

Current Quality of Life in T1D: Psychometrics

A multicenter, quantitative correlational study assessed the quality of life of 229 adolescents with T1D from a behavioral perspective, finding a significant association between quality of life and resilience. During adolescence, young people with diabetes often struggle with self-management and experience compromised health-related quality of life. This often leads to family conflicts that negatively affect all family members. The PedsQL 3.2 Diabetes Module is the most widely used instrument for assessing the quality of life of pediatric patients (2 to 18 years old) with T1D. It consists of five dimensions that measure diabetes symptoms (15 items), treatment barriers (5 items), treatment adherence (6 items), worry (3 items), and communication (4 items). It has excellent construct validity and reliability, enabling it to assess diabetes symptoms and management based on their impact on the patient's daily life. Furthermore, it standardizes results in scientific research [30-36,47].

The Comprehensive Diabetes Self-Management Scale for Parents of Children with Type 1 Diabetes aims to holistically address behaviors that affect diabetes self-management and evaluate its psychometric properties. A cross-sectional, correlational study with a sample of 190 parents of children with T1D assessed parents' self-management of their children's diabetes. Cronbach's alpha for the overall scale was 0.893, and Cronbach's alpha for the subscales ranged from 0.757 to 0.845. Correlations between total and item scores ranged from 0.408 to 0.660 ($p < 0.05$). Validity and reliability analyses revealed that the scale is a valid and reliable measurement tool for Turkish culture.

Discussion

Diabetes has become a global epidemic requiring effective self-management strategies. This is especially crucial for parents of children with type 1 diabetes, as they must make numerous daily decisions and perform complex care activities [42,48-53].

Higueta-Gutiérrez et al. reaffirm this in their systematic reviews and meta-analyses, noting that emotional and school health domains are affected much more than physical health. This is an important finding, since an emotional state associated with higher levels of stress generates higher levels of cortisol, which interfere with insulin metabolism and, consequently, with metabolic control [31].

Intrapersonal factors such as age, sex, self-esteem, self-efficacy, stress, depression, and alcohol abuse are shown to generate long-term complications [54].

Age influences physical activity in type 1 diabetes. Older individuals exercise less. In capillary blood glucose measurements, younger adolescents perform more measurements than older adolescents.

Sex: Men tend to be more physically active than women, but they eat more inappropriately, consuming more calories and achieving lower rates of dietary adherence.

Self-esteem in type 1 diabetes: High levels of self-esteem are associated with greater adherence to physical activity, insulin

dose adjustment, and dental self-care. Reduced self-esteem in adolescents with type 1 diabetes is related to lower rates of capillary blood glucose self-monitoring.

Stress: In women with gestational diabetes, less stress is associated with greater adherence to dietary guidelines and insulin administration. Stress is also associated with the quantity and type of food or diet, and with blood glucose control; with poor adherence to dietary guidelines and metabolic control. Emotional eaters and episodic binge eaters have adherence problems related to negative emotions such as stress and depression.

Depression: There is generally a higher incidence of depression among people with diabetes than in the general population. Patients with depression are more likely to experience diabetes complications, poorer glycemic control, and lower adherence. It is also associated with higher costs.

The review presented by Blanco and Valera on the foundations of psychosocial intervention outlines categories related to the concept of well-being. First, they define it according to specific conditions in the subjective, psychological, and social domains. The most relevant aspect is the link they establish with categories that have precise indicators and that should be present alongside the conceptual categories specific to psychosocial intervention: these are quality of life and mental health [53,16,34].

The American Diabetes Association (ADA) also includes 12 quality standards in the National Standards for Self-Management Education, developed among scientific societies and patient associations. These standards are reviewed every five years and are related to the structure, process, and outcomes of intervention. The elements of the process are based on consensus documents published by leading international organizations: NICE, ADA, European Association for the Study of Diabetes (EASD), Scottish Intercollegiate Guidelines Network (SIGN), and the International Society for Pediatric and Adolescent Diabetes (ISPAD) [38,55-58].

Conclusion

Lifestyle interventions should be offered within a theoretical framework given the heterogeneity of the interventions analyzed in the available scientific evidence [22,23, 53]. The latest consensus from the ISPAD summarizes the current issues and concludes:

Young people with diabetes appear to have a higher incidence of depression, anxiety, and eating disorders, requiring more psychological support than their healthy peers.

Children and young people with chronic poor metabolic control and recurrent ketoacidosis are likely to have more underlying psychosocial problems and psychiatric disorders than their peers with good metabolic control.

Limitations

The inherent publication bias and loss of information (full-text articles) must be considered in our study.

Conflicts of Interest: “The authors declare no conflicts of interest”.

References

- Ministry of Health, Social Services and Equality. NHS Clinical Practice Guidelines (2012). Clinical Practice Guideline on Type 1 Diabetes Mellitus. San Sebastián: Eusko Jaurlaritzaren Argitalpen Zerbitzu Nagusia - Central Publications Service of the Basque Government, 1-345. DOI: https://www.seep.es/images/site/pacientes/GPC_513_Diabetes_1_Osteba_compl.pdf.
- National Diabetes Statistics Report (2020). CDC—Centers for Disease Control and Prevention. 1-31. DOI: <https://stacks.cdc.gov/view/cdc/95536>.
- Institute for Health Metrics and Evaluation (IHME) (2021). Global Burden of Disease 2021: Findings from the GBD 2021 Study. Seattle, WA: IHME.
- Patterson, C.C., Dahlquist, G.G., Gyürüs, E., Green, A. Soltész, G. (2009). Incidence trends for childhood type 1 diabetes in Europe during 1989–2003 and predicted new cases 2005–20: a multicenter prospective registration study. *The Lancet*, 373(9680), 13-19.
- Martínez Brocca MA. (2016). II Comprehensive Diabetes Plan for Andalusia [Electronic Resource]: 2016 Update / Seville: Department of Health, 2016; 3:1-104. 1. Andalusia. Comprehensive Diabetes Plan (2016 Update) 2. Health plans and programs 3. Diabetes mellitus 4. Andalusia. Title WK 810.
- Conde, B.S., Rodríguez, R.M., Bueno, L.G., López, S.J.P., González, P.B., et al. (2014). Epidemiology of type 1 diabetes mellitus in children under 15 years of age in Spain. *An Pediatr (Barc)*, 81(3), 189.e1-189.e12.
- Nathan, D.M. (2014). The Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications Study at 30 Years: Overview. *Diabetes Care*, 37(1), 9-16.
- Lind, M., Svensson, A.M., Kosiborod, M., Gudbjornsdottir, S., Pivodic, A., et al. (2014). Glycemic Control and Excess Mortality in Type 1 Diabetes. *N Engl J Med*, 371(21), 1972-1982.
- Yoldi, C. (2020). Structured Therapeutic Education Programs. Therapeutic Education Working Group. 1st ed. Spanish Diabetes Society (SED).
- Plener, P.L., Molz, E., Berger, G., Schober, E., Mönkemöller, K., et al. (2015). Depression, metabolic control and antidepressant medication in young patients with type 1 diabetes. *Pediatric Diabetes*, 16(1), 58-66.
- Powers, M.A., Bardsley, J.K., Cypress, M., Funnell, M.M., harms, D., et al. (2020). Diabetes Self-Management Education and Support in Adults with Type 2 Diabetes: A Consensus Report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association. *Diabetes Care*, 43(7): 1636-1649.
- Mathiesen, A.S., Egerod, I., Jensen, I., Kaldan, G., Langberg, I., et al. (2018). Psychosocial interventions to reduce diabetes distress in vulnerable people with type 2 diabetes mellitus: a systematic review and meta-analysis. *Diabetes, Metabolic Syndrome and Obesity*, 12: 19-33.
- NICE guideline [NG17] Published date: August 2015 Last updated: July 2016. <https://www.nice.org.uk/guidance/ng17/chapter/About-this-guideline>.
- Page, M.J., McKenzie, J.E., Bossuyt, P.M. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372, 71.
- Matthew J.P., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., et al. (2021). The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *Revista Española de Cardiología*, 74(9), 790-799.
- "Strategies to Enhance the Use of Novel CGM in Early Childhood" Study Group (SENCE). (2021). 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*, 44(2), 464-472.
- Dai, H., Chen, Q., Huang, H., Wu, K., Yang, X. (2022) The role of nurses in taking care of children with type 1 diabetes. *Altern Ther Health Med*, 28(1), 107-113.
- Smudja, M., Milenković, T., Minaković, I., Zdravković, V., Javorac, J., et al. (2024). Self-care activities in pediatric patients with type 1 diabetes mellitus. *PLoS One*, 19(3), e0300055.
- Madrigal, M.A., López, M., Sánchez, A., Cao, M.J., Castro, M.J., et al. (2020) Type 1 diabetes mellitus in pediatric patients and its impact on relationships in the family environment. *Diabetes Metab Syndr Obes*, 13, 4973-4980.
- Chiang, J.L., Maahs, D.M., Garvey, K.C., Hood, K.K., Laffel, L.M., et al. (2018). Type 1 diabetes in children and adolescents: A position statement by the American diabetes association. *Diabetes Care*, 41(9), 2026-2044.
- Henríquez, T.R., Velásquez, C.R. (2018). Psychosocial impact of type 1 diabetes mellitus in children, adolescents, and their families: A literature review. *Rev Chil Pediatr*, DOI: <http://dx.doi.org/10.4067/S0370-41062018005000507>.
- Cardemil N.V. (2021). Diabetic Onset in Pediatrics: A Therapeutic Approach from the Perspective of Nursing. Cantabria.
- Lizama, F. (2020). Impact on quality of life in adolescents with type 1 diabetes mellitus. *Rev Chil Pediatr*, 91(6), 968-981.
- López Sigüero, J.P., González, P.O., Gómez Gila, A.L., Gea, L.I. (2018). The status of type 1 diabetes mellitus in Andalusia: Clinical care data, use of advanced therapies, and human resources. *Anales de Pediatría*, 89(2), 111-116.
- Mansour, M., Parizad, N., Maslakhak, H.M. (2023). Does family-centered education improve treatment adherence, glycosylated hemoglobin, and blood glucose levels in patients with type 1 diabetes? A randomized clinical trial. *Nurs Open*, 10(4), 2621-2630.
- Sancho, G.E. (2018). Diabetic onset in pediatrics: Epidemiology and factors influencing metabolic control of the disease. University of Valladolid, DOI: <https://uvadoc.uva.es/handle/10324/31675>.
- Jaensch, L., Goodard, G., Oxlad, M., Franke, E. (2023). Health Professionals' Experiences Supporting People with Type 1 Diabetes Mellitus Who Deliberately Restrict and/or Omit Insulin for Weight, Shape, and/or Appearance: A Meta-synthesis. *Canadian J Diabetes*, 47(6), 532-542.
- Al Bayrakdar A. (2024). Challenging diabetes mellitus-related stigma with targeted education. *Nurs Stand*, DOI: 10.7748/ns.2024.e12404.
- Álvarez Casaño, M., Alonso Montejo, M.M., Leiva Gea, I., Jiménez Hinojosa, J.M., Santos Mata, M. Á., et al. (2019). Study of direct costs of type 1 diabetes mellitus in patients aged 2 to 16 years in Andalusia. *Endocrinología, Diabetes y Nutrición*, 66(8), 480-486.
- Lukács, A., Mayer, K., Sasvári, P., Barkai, L. (2018). Health-related quality of life of adolescents with type 1 diabetes in

- the context of resilience. *Pediatr Diabetes*, 19(8), 1481-1486.
31. Higuít-Gutiérrez, L.F., Vargas-Alzate, C.A., Cardona-Arias, J.A. (2015). Impact of diabetes, overweight and obesity on health-related quality of life of adolescents: meta-analysis. *Rev. chil. Nutr*, 42(4), DOI: <http://dx.doi.org/10.4067/S0717-75182015000400010>.
 32. Cardona, R. (2024). Influence of socioeconomic factors on glycemic control and therapeutic adherence therapeutics and quality of life.
 33. Szypowska, A., Schwandt, A., Cardona-Hernandez, R. (2024). Insulin pump therapy in children with type 1 diabetes: analysis of data from the SWEET registry. *Pediatr Diabetes*, 17(Suppl. 23), 38-45.
 34. Ceran, M.A., Bektas, M., Eklioglu, B.S. (2024). Development and psychometric evaluation of the Type 1 Diabetes Mellitus Self-Management Scale for Parents. *Rev. Europea de Pediatría*, 183(9), 3767-3776.
 35. Political Watch. (2024). Database: Beyond Insulin: Limitations in the Search for Curative Therapies and Investment in Type 1 Diabetes Research in Spain.
 36. Vázquez, M.A. (2024). Experiences Surrounding the Diagnosis of T1D in Children, Adolescents, and Their Families.
 37. Chrvla, C.A., Sherr, D., Lipman, R.D. (2016). Diabetes Self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. *Patient Educ Couns*, 99(6), 926-943.
 38. Niinistö, S., Cuthbertson, D., Miettinen, M.E., Hakola, L., Nucci, A., et al. (2024). High Concentrations of Immunoglobulin G Against Cow Milk Proteins and Frequency of Cow Milk Consumption Are Associated With the Development of Islet Autoimmunity and Type 1 Diabetes-The Trial to Reduce Insulin-dependent Diabetes Mellitus (IDDM) in the Genetically at Risk (TRIGR) Study. *J Nutr*, 154(8), 2493-2500.
 39. Lampousi, A.M. (2021). Dietary factors and risk of islet autoimmunity and type 1 diabetes: a systematic review and meta-analysis. *EBioMedicine*, 72(10), 3633.
 40. Phelan, H., Lange, K., Cengiz, E., Gallego, P., Majaliwa, E., et al. (2018). ISPAD Clinical Practice Consensus Guidelines 2018: Diabetes education in children and adolescents. *Pediatric Diabetes*, 19 (Suppl. 27), 75-83.
 41. Funnell, M.T., Brown, T., Ghilds, B., Haas, L.B., Jensen, B., et al. (2012). National Standards for Diabetes Self-Management Education. *Diabetes Care*, 35: S101-S108.
 42. Villaécija, J., Luque, B., Castillo-Mayén, R., Farhane-Medina, N.Z., Tabernero, C. (2023). Influence of Family Social Support and Diabetes Self-Efficacy on the Emotional Wellbeing of Children and Adolescents with Type 1 Diabetes: A Longitudinal Study. *Children*, 10(1196), 1-12.
 43. DiMeglio, L.A., Acerini, C.L., Codner, E. (2018). ISPAD Clinical Practice Consensus Guidelines 2018: Glycemic control targets and glucose monitoring for children, adolescents, and young adults with diabetes. *Pediatr Diabetes*, 19(Suppl 27), 105-114.
 44. Fernández Ramos, C., Arana Arri, E., Jiménez Huertas, P., Vela, A., Rica, I. (2017). Incidence of childhood onset type 1 diabetes in Biscay, Spain, 1990-2013. *Pediatr Diabetes*, 18, 71-76.
 45. Grosse, J., Hornstein, H., Manuwald, U., Kugler, J., Glauche, I., et al. (2018). Incidence of diabetic ketoacidosis of new-onset type 1 diabetes in children and adolescents in different countries correlates with human development index (HDI): An updated systematic review, meta-analysis, and meta-regression. *Horm Metab Res*, 50(3), 209-222.
 46. National Statistics Institute. Documents. External migratory movements. January 2020. Available at: https://www.ine.es/dyngs/INEbase/es/n.?c=Estadistica_C&cid=1254736177000&menu=ultiDatos&idp=1254735573002/.
 47. Porcel Chacon, R. (2024). Evaluation of Metabolic Control and Direct Costs in Pediatric Patients with Type 1 Diabetes Mellitus Following the Implementation of a Flash Interstitial Glucose Monitoring System.
 48. Piñate, S., Diaz, L., Contreras, F. (2020) Therapeutic education in patients with diabetes and emotional disorders. *Postgraduate Digital Magazine*, 9(1).
 49. Luque, B., Villaécija, J., Castillo-Mayén, R., Cuadrado, E., Rubio, S., et al. (2022) Psychoeducational Interventions in Children and Adolescents with Type-1 Diabetes: A Systematic Review. *Clínica y Salud*, 33: 35-43.
 50. Bandura, A. (2012) On the functional properties of perceived self-efficacy revisited. *Journal of Management*, 38: 9-44.
 51. American Diabetes Association. (2014). Diagnosis and classification of diabetes mellitus. *Diabetes Care*, 37(1), 81-90.
 52. Fundación para la Diabetes Spain; 2015. [Updated daily; accessed December 11, 2024]. DOI: <http://www.fundaciondiabetes.org/infantil/176/que-es-la-diabetes-ninos>.
 53. Mosqueda-Díaz, A., Mendoza-Parra, S., Jofré-Aravena, V., Barriga, O.A. (2015). Validity and reliability of a perceived social support scale in an adolescent population. *Enferm. Glob*, 14, 125-136.
 54. Wolfsdorf, J.I., Glaser, N., Agus, M. (2018). ISPAD Clinical Practice Consensus Guidelines 2018: Diabetic ketoacidosis and the hyperglycemic hyperosmolar state. *Diabetes Pediatr*, 19(S27), 155-177.
 55. Lawrence, S.E., Albanese-O'Neill, A., Besancon, S., Black, T., Bratina, N., et al. (2022). ISPAD Clinical Practice Consensus Guidelines 2022: Management and support of children and adolescents with diabetes in school. *Pediatr Diabetes*, 23(8), 1478-1495.
 56. Tell, S.S., Schafer, M., Vigers, T., Baumgartner, A.D., Lyon, E., et al. (2022). Rapid-release bromocriptine as adjunctive therapy in youth and adults with type 1 diabetes: A randomized, placebo-controlled crossover study. *Diabetes Obes Metab*, 24(11), 2148-2158.
 57. Commissariat, P.V., DiMeglio, L.A., Kanapka, L.G., Laffel, L.M., Miller, K.M., et al. (2023). Strategies to Enhance New Continuous Glucose Monitor Use (SENCE) Study Group. Psychosocial outcomes at 12 months of continuous glucose monitoring with behavioral support in parents of young children with type 1 diabetes. *Diabet Med*, 40(8), e15120.
 58. González, B.A., López, D.I., Miranda, S.A., Blázquez, L.M.I. (2020). What has changed in the last 19 years in our population of children with type 1 diabetes at diagnosis? *Rev Esp Endocrinol Pediatr*, 11, 15-23.

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