

**BIOPSYCHOSOCIAL PEDIATRIC NURSING
INTERVENTIONS IN THE ADOLESCENT DIAGNOSED
WITH TYPE 1 DIABETES MELLITUS: A LITERATURE
REVIEW**

**INTERVENÇÕES DE ENFERMAGEM PEDIÁTRICA
BIOPSISSOCIAL NO ADOLESCENTE COM DIAGNÓSTICO DE
DIABETES MELLITUS TIPO 1: UMA REVISÃO DA LITERATURA**

Eduarda Vieira

São José de Cluny School of Nursing and Santa Maria Health
School

Ana Viveiros

São José de Cluny School of Nursing and Santa Maria Health

Joana Fonseca

São José de Cluny School of Nursing and Santa Maria Health

Olívia Barcelos

São José de Cluny School of Nursing and Santa Maria Health
School

Goreti Marques

Santa Maria Health School and CINTESIS

Rita Fernandes

Nursing School of Porto and CINTESIS

Abstract

Type 1 Diabetes Mellitus (DM1) influences the adolescent's self-perception, behaviour, and integration into the social environment. The practice of Nursing Specialists in Children and Paediatric Health promotes their adaptation to the disease. The current study aimed to identify and reflect on the interventions of these specialist nurses with adolescents with DM1 and their families. We performed a literature review of the existing literature about the impact of DM1 on adolescents and the relevance of Specialist Nurses in Children and Paediatric Health in providing care to adolescents and their families. From online databases, we selected 21 publications. The nurse's intervention must contemplate the adolescent in his macrosystem. Since diagnosis, the specialist nurse must recognize the adolescent's difficulties, combining technical care with constant emotional support. The nurse's intervention enables the adolescent and

family to manage feelings, adjust the therapeutic regimen and integrate new routines into their daily lives.

Keywords: Diabetes Mellitus type 1, adolescent, family, nursing care, pediatric nursing

Resumo

A Diabetes *Mellitus* tipo 1 (DM1) influencia a autopercepção do adolescente, os seus comportamentos e a sua integração no meio social. A prática do Enfermeiro Especialista em Saúde Infantil e Pediátrica promove a sua adaptação à doença. Pretende-se identificar e refletir sobre as intervenções desse enfermeiro especialista junto do adolescente com DM1 e a sua família. Realizou-se uma revisão de literatura sobre o impacto da DM1 no adolescente e a relevância do enfermeiro especialista em Saúde Infantil e Pediátrica na prestação de cuidados ao adolescente e família. Foram selecionados 21 artigos publicados em bases de dados *online*. A intervenção do enfermeiro deve contemplar o adolescente no seu macrossistema. Desde o diagnóstico, é determinante que o enfermeiro especialista em Saúde Infantil e Pediátrica reconheça as dificuldades do adolescente, combinando o cuidado técnico com apoio emocional constante. A intervenção do enfermeiro capacita o adolescente e a família para a gestão de sentimentos, adequação do regime terapêutico e integração de novas rotinas no seu quotidiano.

Palavras-chave: Diabetes *Mellitus* tipo 1, adolescente, família, cuidados de enfermagem, enfermagem pediátrica

Introduction

DM1 is a chronic disease that occurs when the immune system destroys the pancreatic beta cells responsible for producing insulin, a hormone that converts glucose circulating in the bloodstream into energy for the cells. The symptoms that characterise DM1 are polydipsia, polyuria, enuresis, sudden weight loss, blurred vision, fatigue, increased appetite, and generalised discomfort. However, the diagnosis is usually late, since the symptoms are common to other pathologies, but it is made according to a protocol based on the evaluation of serum glucose levels or glycated haemoglobin. The aetiology of DM1 is still not fully known, but existing research says that it is related to the combination of genetic and environmental factors. This endocrine disease affects people of all ages (International Diabetes Federation, IDF, 2021).

According to the IDF (2021), insulin deficiency causes hyperglycaemia in its carriers that, in the long term, cause damage to the body such as cardiovascular diseases,

neuropathies, nephropathy, and retinopathy. In the short term, poor control of DM1 can cause hypoglycaemia and ketoacidosis.

People with DM1 need daily treatment with insulin in order to maintain blood glucose levels within the reference ranges considered normal; otherwise, the imbalance between these values could lead to the manifestation of symptoms that are difficult to reverse. The prevention of sequelae, or the postponement of their appearance, involves correct management of insulin administration, monitoring blood glucose levels, following a healthy diet, practicing physical exercise, and accessing health and education teams for diabetes. Compliance with this therapeutic plan is not always easy, for adolescents as for families, in some countries access to treatment is expensive and limited. Therefore, living with DM1 is a challenge for children, especially teenagers, and their families, even if they have access to all the necessary resources available (IDF, 2021).

According to the Annual Report of the National Diabetes Observatory (Portuguese Society of Diabetology, 2016), DM1 in Portugal affects 3327 children and young people aged between 0 and 19 years, corresponding to 0.16% of the population in this age group; this value has remained stable in recent years. However, the same source indicates that the incidence rate has been decreasing in the last decade, showing 11.5 new cases per 100,000 individuals in the same age group mentioned above.

In addition to the physiological consequences, DM1 causes emotional damage to the paediatric population and their families. The treatment of this pathology changes routines, affects social and family relationships, imposes dietary restrictions, subjects the child to painful procedures, causes body changes, and, in some cases, involves hospital admissions. In addition, children and adolescents find it difficult to accept the disease, factors that lead to anger and stress in adolescents and their caregivers (Alencar et al., 2013; Aguiar et al., 2021). Allen et al. (2016) reinforce that, in the long term, these adolescents are more likely to develop depression and anxiety, as well as difficulty in establishing relationships and maintaining a good family environment.

Adolescence is a challenging stage, both in terms of psychomotor development and in terms of socio-affective development. At this life cycle stage, several complex biopsychosocial changes affect young people, making adolescence one of the most impactful transition stages of human development. The same authors support that physical, psychological, and social changes influence the way adolescents see themselves and relate to others. The diagnosis of a chronic disease, such as DM1, is a huge change in these young people's lives and how they see themselves (Alencar et al., 2013).

That said, living with DM1 is a challenge, especially for adolescents, since this phase alone contains a vast set of biopsychosocial changes (Batista et al., 2021). In this sense, the specialist nurse in Child and Paediatric Health has a privileged role with adolescents with DM1 and their families. Its practice must be based on the most recent and robust scientific evidence, so the planned interventions must result from the combination of the best and most current scientific knowledge with the care expectations of the individual being cared for (Peixoto et al., 2016), contributing thus review for the production of foundations for sustained nursing practice.

Objectives

The realisation of this literature review aims to understand the reality of specialised care for children/adolescents and families in the context of illnesses, such as diabetes. The specific objectives are to understand the impact of DM1 on the biopsychosocial health of adolescents and their families, to deepen their knowledge about action strategies and nursing interventions with adolescents with DM1 and their families from the perspective of specialist nurses in Child and Paediatric Health, as well as to reflect on the importance of this specialist nurse in the follow-up of adolescents with DM1 and their families.

Methodology

A literature review, including some integrative review criteria, was based on the assimilation of essential aspects that characterise DM1 to understand its impact on the biopsychosocial health of adolescents and their families, thus seeking to list specialised nursing interventions that support the importance of the specialist nurse in Child and Paediatric Health. However, the present review also includes other professional's intervention, as their actions could also be integrated in the specialised nursing care.

When conducted the narrative literature review, and after identifying and analysing the problem under study, the path to follow was defined to gather, analyse, compare, and describe the available scientific evidence (Hopia et al., 2016).

This time, we used the databases through the EBSCOhost search engine, namely the CINAHL Complete, MEDLINE Complete, and Cochrane Database of Systematic Reviews databases. Also, other important databases for the health area were consulted, such as the Scientific Electronic Library Online (SciELO), the Open Access Scientific Repositories of Portugal (RCAAP), and PubMed. In the latter, and to ensure the scientific nature of the research, the Medical Subject Headings (MeSH) terms to be used were identified, namely: (Type 1 Diabetes Mellitus) AND (adolescent OR family) AND (nursing care OR paediatric nursing); (Diabetes Mellitus tipo 1) AND (adolescente OR família) AND (cuidados de enfermagem OR enfermagem pediátrica); (Diabetes Mellitus tipo 1) AND (adolescente OR familia) AND (cuidados de enfermería OR enfermería pediátrica), in isolation, but also combined by the Boolean AND, OR operator.

It should be noted that the research was carried out according to the following inclusion criteria: published articles only, articles with a production date of the last 10 years and availability of full text in Portuguese, English, or Spanish. Exclusion criteria included all articles that included other pathologies, including type 2 diabetes, and studies carried out in the adult population.

Sequentially, the research was conducted, and the consequent compilation of the scientific production found on the themes that make up the subject under study, under the defined inclusion and exclusion criteria requirements. Therefore, a PRISMA flowchart

was built to show the process of identifying and selecting relevant literature (Page et al., 2021).

After reading and interpreting the titles and respective abstracts, the documents with the most appropriate content were selectively sorted, taking into account the established objectives, and comparing them in terms of the information offered. Finally, the product of the research and its treatment was combined and compiled, resulting in the present narrative document, not neglecting its interconnection with some reference documents for the nursing practice of Nursing Specialists in Children and Paediatric Health.

Results

From the initially carried out research, 301 searched documents were obtained, of which 38 were eligible according to filtering with the application of the inclusion and exclusion criteria mentioned above. A careful reading and interpretation of the titles and abstracts of each one resulted in 21 articles, as shown in Figure 1.

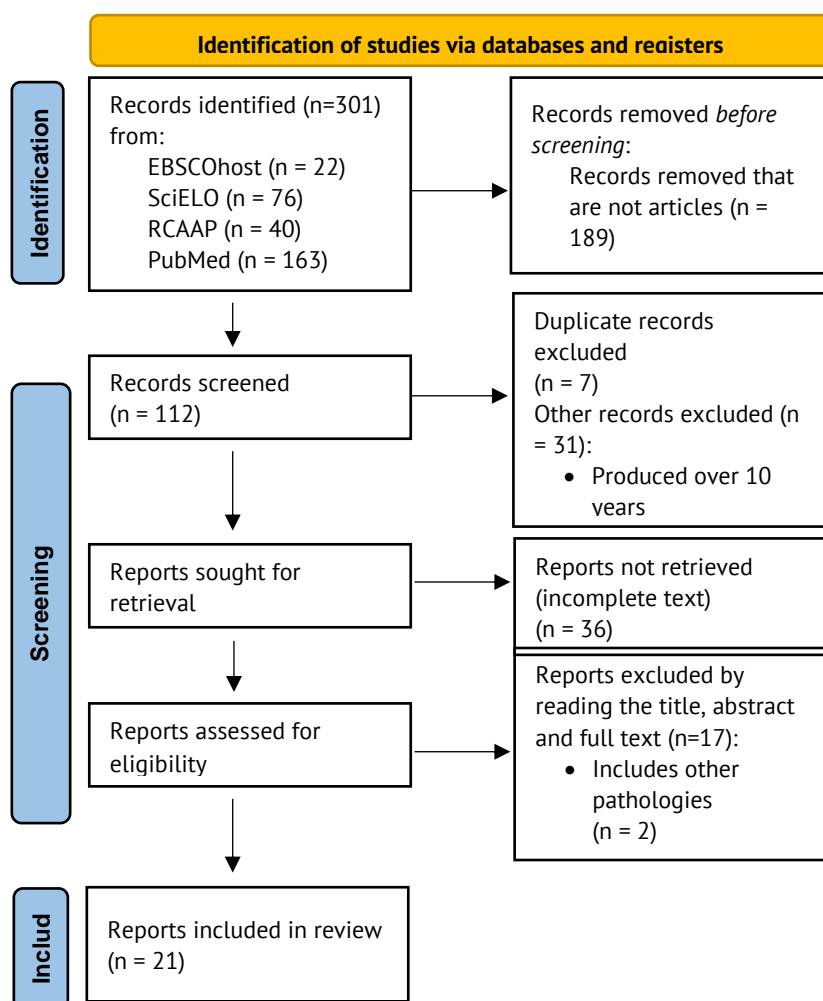


Figure 1. The PRISMA Flow Diagram of Study Selection

According to the bibliography included we grouped by types of interventions from publications that were summarised as shown in Table 2 (authors, year, title, and focus of attention); it was verified that DM1 causes a great biopsychosocial impact on adolescents and their families. When DM1 appears in adolescence, in addition to dealing with the conflicts inherent to age, adolescents have to learn to manage the disease, which proves to be extremely difficult since it requires discipline and a change in lifestyle. Thus, the need to change their lifestyle affects their physical, emotional, and social conditions, which is why nurses must create a relationship with adolescents and their families from the diagnosis onwards, considering the fundamental aspects that prioritise the relationship between the biological, psychological and social contexts of health.

Table 2
Articles included in the literature review

Authors, Year, Title	Objectives	Methodology	Results
Aguiar G., et al. (2021). Children with Type 1 diabetes Mellitus: the experience of illness.	Identify the main challenges faced by children with type 1 diabetes mellitus and describe their coping strategies	Qualitative study conducted with a semi-structured interview	- The process of coping with the disease is different for each adolescent; - Family support and health professionals are essential.
Alencar D., et al. (2013). Feelings of adolescents with Diabetes Mellitus regarding the process of living with the disease.	Understand the experience of adolescents facing the process of living with diabetes	Descriptive-exploratory research with qualitative approach	- Understanding the behaviours, fears, and anxieties of adolescents with DM1 for more personalized support.
Allen J, et al. (2016). A longitudinal examination of hope and optimism and their role in type 1 diabetes in youths.	Test the longitudinal associations between hope and optimism and health outcomes (i.e., HbA1c and self-monitored blood glucose [SMBG]) among youths with Type 1 diabetes mellitus (T1DM) over a 6-month period	Longitudinal research	- Importance of hope promotion in the management of DM1.
Batista A., et al. (2021). Adolescents with type 1 diabetes mellitus and their process of building autonomy for self-care.	Analyse the process of developing autonomy for self-care in adolescents with type 1 diabetes mellitus	Descriptive-exploratory research	- Supporting adolescents in building autonomy for self-care to overcome difficulties in managing DM1 and preventing complications.
Borges B., et al. (2016). Type 1 Diabetes Mellitus in adolescents: from diagnosis to the daily contact with the illness.	Understand the daily life of adolescent patients who live with Diabetes Mellitus Type 1	Exploratory and qualitative study	- Understanding the daily lives of adolescents with DM1 allows for humanised and personalised nursing care.
Cruz, D., Collet, N., & Nobrega, V. (2018). Quality of life related to health of adolescents with DM1: an integrative review.	Analyse the scientific literature on health-related quality of life (HRQOL) of adolescents with type 1 diabetes mellitus	Integrative review	- Knowledge about the quality of life of adolescents with DM1 can contribute to the improvement of nursing care.
Feitor S., et al. (2020). Community empowerment in school health – adolescent with diabetes mellitus type 1.	Elaborate a Nursing Care Plan Model aimed at training the school community with adolescents with DM1, using ICNP 2017	Literature review	- Health education in schools to include adolescents with DM1.
Flora M., & Gameiro M. (2016 ^a). Self-care of Adolescents with	Identify the knowledge of adolescents with T1DM about the disease and	Descriptive-analytical and cross-sectional study.	- Directed intervention to increase the levels of knowledge about DM1.

Type 1 Diabetes Mellitus: Knowledge about the Disease.	respective care; to analyse the relationship between the knowledge of adolescents with T1DM about the disease and respective care and age and gender		
Flora M., & Gameiro M. (2016b). Self-care of adolescents with type 1 diabetes: responsibility for disease management.	Determine the responsibility of adolescents with T1D for self-care roles, and analyse the relationship between the responsibility of adolescents with T1D for self-care roles and age and gender	Descriptive-analytical and cross-sectional study.	<ul style="list-style-type: none"> - Responsibility in self-care in the face of DM1; - Family, peers, and health professionals as support.
Fornasini S., Piras E., & Miele F. (2019). The consequences of type 1 diabetes onset on family life. An integrative review.	Synthesise what is known about the consequences of T1DM onset for families and, in particular, how parents share the emotional, practical and educational burden of care connected with diabetes management	Integrative review	<ul style="list-style-type: none"> - DM1 as a familial disease; - Family-centred care; - Focus on emotions, routines and precise knowledge about DM1.
Fragoso L., et al. (2019). Self-Care Among Type 1 Diabetes Mellitus Bearing People: Adolescents' Experience	Identify the adolescents' experiences in the management of diabetes mellitus, regarding self-care	Descriptive research with a qualitative approach	<ul style="list-style-type: none"> - Importance of supported self-care; - Adherence to the therapeutic regimen.
Freitas K., et al. (2020). Self-report of child and adolescent in his daily lives with diabetes: narrative study.	Understand the daily life of children and adolescents diagnosed with type 1 diabetes mellitus	Exploratory study with a qualitative approach	<ul style="list-style-type: none"> - Family changes; - Changes in lifestyles; - Psychological impact; - Social adaptation.
Galler A., et al. (2020). Psychological care in children and adolescents with type 1 diabetes in a real-world setting and associations with metabolic control.	Assess psychological care in children and adolescents with type 1 diabetes in a real-world setting and to evaluate associations with metabolic outcome	Longitudinal and comparative analysis	<ul style="list-style-type: none"> - Psychological care is associated with better disease control.
Gomes G., et al. (2019). Family experiences in the diagnosis of diabetes mellitus in children/adolescents	Identify the experiences of the relative in the diagnosis of Diabetes Mellitus in the child/adolescent	Qualitative research	<ul style="list-style-type: none"> - Understanding the experience and supporting the adolescent and family allows the nurse to reduce the impact of the diagnosis.
Leal D., et al. (2012). The experience of family members of	Describe the significant experiences of family members living with	Qualitative research	<ul style="list-style-type: none"> - Importance for the nurse to understand the family's experience with diabetes

children and adolescents with type 1 diabetes mellitus.	children and/or adolescents with type 1 diabetes		and include it in the care plan.
Machado T., et al. (2021). The child with Type I diabetes: implications for Nursing.	Evaluate, through research on previously published works, how the nursing professional participates in the treatment of type 1 diabetes in children	Descriptive-exploratory research with qualitative approach	- Dynamization of nursing intervention to minimise anxiety and pain in the face of diabetes.
Nass E., et al. (2019). Psychosocial self-efficacy in young people with diabetes mellitus and its influence on self-care.	Identify psychosocial self-efficacy in young people with Type 1 diabetes mellitus and its association with sociodemographic variables, health profile, and search for health care.	Cross-sectional study	- Influence of the psychosocial component on the self-care of adolescents with DM1.
Pérez-Marín, M., Gómez-Rico, I., & Montoya-Castilla, I. (2015). Type 1 diabetes mellitus: psychosocial factors and adjustment of paediatric patient and his/her family. Review.	Study the main psychosocial factors associated with the adjustment of these paediatric patients and their families	Literature review	- Implementation of psychosocial intervention in diabetes.
Pires A., Aparicia G., & Duarte J. (2016). Validation study of the scale Child's satisfaction with the diabetes nursing consultation	Validate the scale "Child's satisfaction with the diabetes nursing consultation"	Quantitative, cross-sectional and analytical study	- Relevance of the diabetes nursing consultation to children and adolescents.
Wang Y., Brown S., & Horner S. (2013). The school-based lived experiences of adolescents with type 1 diabetes.	Obtain an initial understanding of school-based lived experiences of adolescents with T1DM to serve as a foundation of future research	Heidegger's hermeneutic phenomenological approach	- Intervention with the aim of achieving autonomy in the management of DM1; - Empower the school community; - Proactivity in school health.
Zanatta E., et al. (2020). Experiences of adolescents with type 1 diabetes.	Understand how adolescents live with type 1 diabetes and describe their sociodemographic profile	Quantitative/qualitative exploratory, descriptive research	- Great impact of DM1 on the routine of adolescents; - Need for family, social and health support.

To promote the autonomy and involvement of adolescents throughout the therapeutic process, it is important to establish a partnership with the family and the entire health team. To ensure the success of the whole process, it is essential that peers, teachers, and the community are integrated in the same way, not only in the therapeutic regime but also in general, leading to the gradual acceptance of the disease and its limitations (Ramos & Figueiredo, 2020).

The discussion that follows will initially make a special allusion to the role of the specialist nurse in Child and Paediatric Health, not only in DM1 but also in the family context of adolescents. Subsequently, the focus is given to the literature found on the psychological domain of specialised nursing intervention, which will focus on aspects related to acceptance of the disease, coping strategies to deal with it, and the necessary knowledge to build on it. This is followed by intervention in the biological field, which includes the readaptation of lifestyles regarding food and physical exercise, glycaemic control, and insulin administration. Finally, regarding the social domain, issues related to the support of peer groups, inclusion in support groups, and intervention in the school context from the point of view of health education will be addressed.

Discussion

The diagnosis of DM1 in such a challenging stage of life as adolescence is a set of demands that place adolescents and their families in a sensitive position from the point of view of managing their health (Alencar et al., 2013). The increased responsibility that is abruptly attributed to them, as well as the associated losses represent a kind of shock through which a grieving process in the face of the disease begins (Leal et al., 2012), which extends from denial to acceptance of the illness.

In the context of DM1, according to Pires et al. (2016), the good results behind the nurse's intervention are fundamental therapeutic education, so "nurses have a key role in the diabetes consultation, and should develop their educational practice in a humanised, individualised way and adapted to the characteristics of the child/ family" (p. 43). In accordance with the Order of Nurses, Pires et al. (2016) advocate that within the scope of health care in diabetes are taken into account the needs of adolescents facing the disease, considering their particularities. On the other hand, the Portuguese Nurses Order (2011), through the Guiding Guides for Good Practice in Child Health Nursing, states that therapeutic education must be governed by attitudes, values, beliefs, objectives, preconceived ideas, and the cognitive availability to learn.

In general, it is crucial that the specialist nurse in Child and Paediatric Health responds to the real and potential needs of adolescents, adapting their intervention to their abilities, respecting their learning and adaptation times, with space for the expression of emotions facilitated by the establishment of an empathetic and trusting therapeutic relationship, as advocated by the Regulation no. 422/2018 -Regulation of Specific Skills for Specialist Nurses in Children and Paediatric Health Nursing (2018). Also, Gomes et al. (2019) highlight the differentiated comprehensive care that nursing must comply with, which is also multidisciplinary, thus developing health education strategies to promote adherence to therapeutic measures, not only by adolescents but also by their families.

Fornasini et al. (2019) describe DM1 in adolescence as a "family disease", which affects the entire system and functioning of a family. According to Cruz et al. (2018), the family is one of the main pillars of adolescents in the process of adapting to the new health condition, so for Gomes et al. (2019), it is essential that the specialist nurse Child

and Paediatric Health also understand the feelings and needs of family members in the face of the diagnosis, that they are able to provide the greatest and best support to their adolescent. Nass et al. (2019) also recognise the importance of the family throughout the process but add that it does not replace all the multidisciplinary professional follow-up to which adolescents are entitled. Among several interventions, Gomes et al. (2019) highlight the transmission of knowledge through awareness-raising actions and information documents, as well as the sharing of experiences in support groups designated for this purpose. Once the family's needs have been identified, Gomes et al. (2019) say that nurses can contribute in a more sensitive way to reduce the impact of the diagnosis, as well as support the family member and the child/adolescent in coping with the changes required by the disease, thus promoting their potential well-being and the best possible quality of life (Machado et al., 2021).

The authors mentioned above argue that nurses should constantly evaluate their intervention and the strategies adopted, adapting them accordingly to encourage the development and biopsychosocial well-being of adolescents and their families. The way in which specialist nurses are available, their conduct in transmitting and sharing knowledge, and the involvement of adolescents and families in the care plan are reflected in self-care in the face of DM1 (Pires et al., 2016). However, because the development of specialist nurse skills is also carried out from a preparatory perspective, the same guide recalls that the professional who will implement health education strategies must continuously train and improve their practice in order to promote and facilitate adherence of adolescents and their families to the necessary therapeutic measures (Portuguese Nurses Order, 2011).

For all the implicit alterations, Freitas et al. (2020) emphasise the great psychological impact that the complexity of DM1 causes, not only because of the biological transformations it entails but also because of the social changes it brings about. By demanding closer and more regular care, adolescents with DM1 are faced with social repercussions on their relationship with the family and peer group. This relationship influences how adolescents experience their disease process (Freitas et al., 2020). According to Gomes et al. (2019), the greater the responsibility of adolescents for self-care, the better acceptance of their health condition and the greater adherence to established therapies contributing to a better way of being in their social environment.

Consensually, the main focuses of attention listed by the consulted authors are glycaemic control, insulin administration, changing eating habits, practicing physical exercise, emotional instability, and readaptation to the social context (Borges et al., 2016; Freitas et al., 2020; Machado et al., 2021).

Interventions in the psychological domain

The diagnosis of DM1 causes a range of adverse feelings in adolescents, which makes it difficult for them to live with the disease (Nass et al., 2019). Unexpectedly, adolescents find themselves responsible for managing their health and survival, experiencing feelings such as sadness, anger, fear (Alencar et al., 2013), frustration, and

anxiety (Aguiar et al., 2021). According to the same authors, the most expressive feeling, and also the most lasting, in the process of adapting to the disease is a revolt since young people feel constantly challenged by the new health condition, seeing their way of being and existing compromised and, consequently, their future.

In this order of ideas, it is essential that the specialist nurse in Child and Paediatric Health creates the appropriate environment for adolescents and their families to express themselves, free from constraints or judgments, helping them to adopt coping strategies to deal with their own emotions and feelings (Portuguese Nurses Order, 2011). In addition to managing emotions, Batista et al. (2021) add that it is crucial to work on motivational issues since the desire to learn leads to greater and better development of autonomy, both in cognitive and behavioural terms.

In the long term, as stated by Allen et al. (2016), the diagnosis of DM1 in adolescence entails a predisposition to mental consequences, namely depressive and anxiety states. As such, a study carried out by these authors, supported by scientific evidence described by them, realised that the hope that adolescents face their DM1 diagnosis has a direct influence on the health gains obtained. Through the theory of hope, the authors understand the energy of each individual to plan a path and a set of actions to the detriment of a goal, including their intentionality and persistence.

Until adolescents perceive the disease with some normality in their daily lives, they need to accept it. However, acceptance of the disease first involves a complex process of knowing how to deal with it, in so far as adolescents must understand that it is harmful to them and can cause them serious problems, that the behaviours to be adopted are effective in coping with and controlling the disease, and that the difficulties in implementing specific actions and behaviours are overcome by their benefits (Nass et al., 2019).

Complementarily, Galler et al. (2020) demonstrate that intervention in the psychological domain reflects positive effects on the management of DM1 in adolescents, effects that are even more notorious when associated with the construction of knowledge about the disease.

Intervention in the cognitive sphere should be done gradually since having diabetes requires very precise and clear knowledge about the disease, its manifestations, and alterations, as well as future complications (Flora & Gameiro, 2016a). The management and the way in which information about care is transmitted should be the focus of attention of specialist nurses in Child and Paediatric Health, appropriate for the literacy of adolescents and their families (Flora & Gameiro, 2016a), as it is a continuous process that can be repeated as many times as possible. Times are opportune so that the care proves to be effective (Portuguese Nurses Order, 2011). According to the Guiding Guides for Good Practice in Child Health Nursing (Portuguese Nurses Order, 2011), education about diabetes should adjust to the characteristics of each person, according to their “age group, disease stage, maturity, lifestyles, cultural sensitivity” (p. 95), being as direct as possible to the priorities established in partnership between the nurse, the adolescents, and the family.

Adolescents tend to seek and strengthen their knowledge about diabetes when they obtain positive results through their actions based on prior knowledge acquired, thus becoming increasingly autonomous in the management of behaviours and emotions (Batista et al., 2021). Furthermore, when adolescents and their families are properly informed about the disease and its implications, they tend to incorporate and carry out adaptation mechanisms more naturally (Aguiar et al., 2021).

Thus, over time, and with due monitoring and emotional support, the literature makes it known that adolescents effectively adapt to DM1 and its requirements, becoming aware of the chronicity of the disease and possible consequent complications, thus assuming the role of main agents in the management of their health condition (Pérez-Marín et al., 2015; Nass et al., 2019; Freitas et al., 2020; Galler et al., 2020; Zanatta et al., 2020).

Interventions in the biological domain

As previously pointed out, DM1 requires the acquisition of detailed knowledge about the disease so that adolescents recognise their own needs, to the detriment of maintaining their well-being. In this sense, several authors introduce the notions of self-care (Flora & Gameiro, 2016b) and autonomy (Cruz et al., 2018; Batista et al., 2021) in diabetes, which involve care related to the behaviours to be adopted and, or readjust. According to Flora and Gameiro (2016a), self-care comprises behaviours related to blood glucose monitoring and respective records, actions in the face of hyper or hypoglycaemic episodes, insulin administration, diet compliance, and physical exercise.

The autonomy of adolescents in their self-care is better and more effective the greater the support of health professionals and parents, support that contributes not only to an improvement in the quality of life (Cruz et al., 2018) but also to enhance the success of decisions made in the control of diabetes (Batista et al., 2021). Also, in this line of thought, Fragoso et al. (2019) state that nurses should guide adolescents toward their autonomy for self-care, making them responsible (Flora & Gameiro, 2016b) and providing them with the necessary tools to effectively manage their health situation, especially with regard to respect to the adjustment of lifestyles.

Regarding the adequacy of lifestyles, the consulted literature is unanimous when it says that the greatest difficulties pointed out by adolescents are related to food issues (Fragoso et al., 2019; Batista et al., 2021). According to Batista et al. (2021), counting carbohydrates and adapting the diet to glycaemic and therapeutic values are among the biggest challenges experienced by adolescents, along with dealing with the dichotomy between eating food out of desire or impulse and eating controlling this food to better health (Fragoso et al., 2019). Despite not being described in the bibliography found, and in line with Regulation no. 422/2018, the intervention of the specialist nurse in Child and Paediatric Health may involve: establishing adequate and diversified food plans, practicing the exact and safe calculation of carbohydrates, offering alternatives for replacing hypercaloric foods, and negotiating the intake of these foods at special times, not neglecting a multidisciplinary intervention with the nutritionist.

As opposed to difficulties in eating, the practice of physical activity and sports were facilitating aspects in the maintenance and control of diabetes since they were regular habits in the daily lives of adolescents (Fragoso et al., 2019). According to Fragoso et al. (2019), praising and encouraging the maintenance of physical exercise habits may be part of the nurse's and family's actions to effectively maintain these habits. It is also important that the nurse reinforces teachings about the care to be taken before, during, and after the practice of physical activity in the context of diabetes in order to prevent the appearance of possible complications (Portuguese Nurses Order, 2011).

Still, the acts of controlling blood glucose and self-administering insulin are also delicate issues, named by the adolescents interviewed in a study carried out by Fragoso et al. (2019), not only for self-inflicted pain but also for the visual impact caused on others around. The authors add that alternating between body surfaces to assess blood glucose and administer insulin are more specific challenges experienced by adolescents. Accordingly, the nurse must ensure that the teaching is properly assimilated, initially demonstrating and executing it and, later, observing and supervising its implementation by the adolescents. The care to be taken with the conservation of the medication, as well as the handling and disposal of needles and other necessary materials, should be addressed and duly clarified (Machado et al., 2021). Despite emphasising the autonomy and responsibility of adolescents, Fragoso et al. (2019) recall that the family should be included in this type of teaching so that they can assist and/or replace the adolescents whenever necessary.

One way to get around this embarrassment can be the acquisition of the most recent and intelligent continuous insulin infusion pumps, which provide an improvement in the quality of life of diabetic adolescents (Batista et al., 2021). However, the costs associated with this equipment are not exactly accessible to all families, so they say it is an important aspect to be considered by nurses, who must mobilise efforts to bring this matter to government policies so that they share access. The same authors add that the way in which the treatment is carried out has a great influence on how adolescents accept the disease and manage their self-care.

Interventions in the social domain

The way of being before the family, the peer group, and the rest of society changes as soon as adolescents are diagnosed with DM1. The care that needs to be put into practice, described above, places adolescents in a position considered socially sensitive (Zanatta et al., 2020). The impact caused on people who observe the adolescents' behaviours in their self-care facing diabetes can make them the target of discrimination and social exclusion. So it is important for adolescents to have a cohesive support network, essentially integrating family, friends, and health professionals, who will help them face every day life's difficulties with greater success.

Adolescents should live with people and groups who experience the same concerns since sharing experiences increases understanding and reflection that their fears and difficulties are not unique (Zanatta et al., 2020). Nurses must bring together adolescents

with DM1, through support groups, inside or outside the school environment, providing the sharing of similar experiences so that they do not feel socially excluded. These groups should be dynamic and active, providing good times to adolescents outside the healthcare environment (Flora & Gameiro, 2016a) without impositions or judgment of attitudes, avoiding emphasising the negative connotation attributed to the disease (Zanatta et al., 2020). It is essential that adolescents continue to interact with friends and other groups of peers, as the involvement of the latter in the process of adapting to the disease facilitates the social well-being of diabetic adolescents, contributing to the construction of self-confidence in adherence to treatment (Zanatta et al., 2020). However, it is necessary to take into account that the influence exerted by peers and the desire to integrate can constitute threats to the management of the disease since they can lead to deviant behaviours regarding aspects of blood glucose monitoring and medication administration, whether in adjusting lifestyles to the needs of the disease (Wang et al., 2013).

As is known, a large part of the teenagers' day is spent in the school context, where some uncomfortable and stigmatising situations may arise for them (Zanatta et al., 2020). Thus, Feitor et al. (2020) state that the nurse has a role as a mediator between health and education, and the specialist nurse has a fundamental role in preparing the school environment to normalise the needs and practices of adolescents with DM1, both with teaching staff and non-teaching staff or with students. Furthermore, as the increase in knowledge is directly proportional to acceptance and empowerment, the school community must know the pathophysiology of diabetes, understand concepts of hyper and hypoglycaemia, recognise alarm signs, understand the need for therapy, and be prepared to act in emergency cases (Wang et al., 2013; Feitor et al., 2020).

In conclusion, the role of a specialist nurse in Child and Paediatric Health is fundamental in the monitoring of adolescents with diabetes by establishing a partnership with the child/youth and family in order to promote an adequate health plan. Thus, it must mobilise resources, taking into account particularly demanding situations such as diabetes due to its complexity, and use different approaches and therapies, taking into account all life cycle phases. No less important, the nurse should take into account the psychological, biological, and social domains when intervening with adolescents with DM1, never in isolation, but in their reciprocal interaction, each of the domains being able to influence each other.

In general, from the moment of diagnosis and as long as the treatment lasts, it is crucial that the specialist nurse in Child and Paediatric Health recognises each of the difficulties that adolescents face, respects the meanings attributed to the disease, and understands its manifestations, combining care necessary technical support with constant emotional support (Alencar et al., 2013; Borges et al., 2016; Zanatta et al., 2020). The nurse's approach to the disease must be realistic (Pérez-Marín et al., 2015), positivist (Allen et al., 2016), holistic (Gomes et al., 2019), and multidisciplinary (Galler et al., 2020). According to Batista et al. (2021), family and health professionals are fundamental in this health-care construction, supporting them to reach cognitive, behavioural, and emotional

autonomy to trust in their potential to perform self-care, and overcoming the challenges to reach maturity.

Conclusion

The specialist nurse in Child and Paediatric Health interventions are decisive when the diagnosis of DM1 appears in the lives of adolescents and their families since the nurse's role must always be holistic, considering that the biological, psychological, and social needs of the target person care are inseparable. Therefore, nurses specialising in Children and Paediatric Health, in their daily practice with adolescents and their families, must establish a negotiated care partnership, respecting their times and needs, with the aim of training them to manage their feelings, adapting their regime therapy, and integrating their new routines into their social environment.

The way nurses perform their role will directly influence the involvement of adolescents and their families in their treatment, as the process of becoming a teenager may bring with it the appetite for some less appropriate behaviours from the point of view of health promotion in diabetes. Thus, the nurse must be attentive to the slightest signs of frustration and revolt so that these do not compromise adolescents' behaviours and health gains. Unquestionably, the support network constituted by the nurse and family is an important foundation in encouraging the autonomy of adolescents with DM1 for their self-care, contributing to their general well-being, and overcoming the obstacles imposed by the disease and the very challenging phase of the disease.

With this review, it was possible to identify the pathophysiological and statistical aspects of DM1 and understand its impact on the biopsychosocial health of adolescents and their families. Nevertheless, this production allowed deepening knowledge about strategies and interventions of specialised nursing in Child and Paediatric Health with adolescents with DM1 and their families, reflecting the importance of specialist nurses in their follow-up.

It should be noted that the main limitation experienced was the research found intervention in the practice of specialised care in Nursing Children and Paediatric Health. Although it is considered to have made contribute to evidence-based practice concerning the care provided to adolescents with DM1 and their families, the pertinence of carrying out new research studies on the topic addressed is praised. As an example, a systematic literature review is suggested, as well as the development of primary studies on each of the biopsychosocial intervention domains described.

References

- Aguiar, G., Machado, M., Silva, L., Aguiar, R. & Christoffel, M. (2021). Children with type 1 diabetes mellitus: the experience of disease. *Journal of the USP School of Nursing*, (55), 1-8. <https://doi.org/10.1590/S1980-220X2020011803725>.
- Alencar, D., Lima, A., Almeida, V., Sampaio, K., Damasceno, M. & Alencar, A. (2013). Feelings of adolescents with Diabetes Mellitus regarding the process of living with

- the disease. *Brazilian Journal of Nursing*, 66(4), 479-484. <https://doi.org/10.1590/S0034-71672013000400003>.
- Allen, J., Steele, R., Nelson, M., Peugh, J., Egan, A., Clements, M. & Patton, S. (2016). A longitudinal examination of hope and optimism and their role in type 1 diabetes in youths. *Journal of Pediatric Psychology*, 41(7), 741-749. <https://doi.org/10.1093/jpepsy/jsv113>.
- Batista, A., Silva, M., Nóbrega, V., Fernandes, L. & Collet, N. (2021). Adolescents with type 1 diabetes mellitus and their process of developing autonomy for self-care. *Revista de Enfermagem Referência*, (8), 1-8. <https://doi.org/10.12707/RV20213>.
- Borges, B., Neto, J., Falcão, L., Silva, A. & Freitas, R. (2016). Type 1 diabetes mellitus in adolescents: from diagnosis to the daily contact with the illness. *Journal of Nursing*, 10(7), 2328-2335. <https://doi.org/10.5205/reuol.9106-80230-1-SM1007201605>.
- Cruz, D., Collet, N. & Nóbrega, V. (2018). Quality of life related to health of adolescents with dm1: an integrative review. *Ciência & Saúde Coletiva*, 23(3), 973-989. <https://doi.org/10.1590/1413-81232018233.08002016>.
- Feitor, S., Veiga, A., Silva, A., Silva, V., Duarte, S., Sousa, M. & Bastos, F. (2020). Community empowerment in school health - adolescent with diabetes mellitus type 1. *Suplemento digital Rev ROL Enferm* 2020, 43(1), 364-373. <https://comum.rcaap.pt/bitstream/10400.26/31492/1/364-373.pdf>.
- Flora, M. & Gameiro, M. (2016a). Self-Care of Adolescents with Type 1 Diabetes Mellitus: Knowledge about the Disease. *Revista de Enfermagem Referência*, (8), 17-26. <http://dx.doi.org/10.12707/RIV15024>.
- Flora, M. & Gameiro, M. (2016b). Self-care of adolescents with type 1 diabetes: responsibility for disease management. *Revista de Enfermagem Referência*, (9), 9-19. <http://dx.doi.org/10.12707/RIV16010>.
- Fornasini, S., Piras, E. & Miele, F. (2019). The consequences of type 1 diabetes onset on family life. An integrative review. *Journal of Child and Family Studies*, (29), 1467-1483. <https://doi.org/10.1007/s10826-019-01544-z>.
- Fragoso, L., Cunha, M., Fragoso, E. & Araújo, M. (2019). Self-care among type 1 diabetes mellitus bearing people: adolescents' experiences. *Research Journal Care is Fundamental Online*, (11), 289-296. <https://doi.org/10.9789/2175-5361.2019.v11i2.289-296>.
- Freitas, K., Santos, P., Melo, M., Moura, A., Boeckmann, L. & Dutra, L. (2020). Self-report of child and adolescent in his daily life with diabetes mellitus: narrative study. *Nursing Focus*, 11(3), 187-194. <https://doi.org/10.21675/2357-707X.2020.v11.n2.2730>.
- Galler A., Hilgard D., Bollow E., Hermann T., Kretschmer N., Maier B., Mönkemöller K., Schiel R. & Holl R. (2020). Psychological care in children and adolescents with type 1 diabetes in a real-world setting and associations with metabolic control. *Pediatric Diabetes*, 21(6), 1050-1058. <https://doi.org/10.1111/pedi.13065>.

- Gomes, G., Moreira, M., Silva, C., Mota, M., Nobre, C. & Rodrigues, E. (2019). Family experiences in the diagnosis of diabetes mellitus in children/adolescents. *Journal of Nursing and Health*, 9(1), 1-13. <https://doi.org/10.15210/jonah.v9i1.13393>.
- Hopia, H., Latvala, E. & Liimatainen, L. (2016). Reviewing the methodology of an integrative review. *Scandinavian Journal of Caring Sciences*, 30(4), 1-8. <https://doi.org/10.1111/scs.12327>.
- International Diabetes Federation. (2021). IDF Diabetes Atlas. 10th Edition. <https://diabetesatlas.org/>.
- Leal, D., Fialho, F., Dias, I., Nascimento, L. & Arruda, W. (2012). The experience of family members of children and adolescents with type 1 diabetes mellitus. *Revista Eletrônica de Enfermagem*, 14(1), 189-196. <https://doi.org/10.5216/ree.v14i1.9641>.
- Machado, T., Souza, A., Silva, J., Silva, E., Silva, G. & Ricci, A. (2021). The child with Type I diabetes: implications for Nursing. *Revista Pró-UniverSUS*, 12(2), 32-38. <https://doi.org/10.21727/rpu.v12i2.2669>.
- Nass E, Marcon S, Teston E, Haddad M, Reis P, & Lino I (2019). Psychosocial self-efficacy in young people with diabetes mellitus and its influence on self-care. *Revista Rene*, 20, 1-8. <https://doi.org/10.15253/2175-6783.20192041412>.
- Page, M., McKenzie, J., Bossuyt, P., Boutron, I., Hoffmann, T., Mulrow, C., Shamseer, L., Tetzlaff, J., Akl, E., Brennan S., Chou, R., Glanville, J., Grimshaw, J., Hróbjartsson, A., Lalu, M., Li, T., Loder, E., Mayo-Wilson, E., McDonald, S. ... Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372(71), 1-9. <https://doi.org/10.1136/bmj.n71>.
- Portuguese Nurses Order (2011). Guiding Guides for Good Practice in Child and Pediatric Health Nursing. https://www.ordemenfermeiros.pt/media/8906/cadernosoe_guiasorientadoresboapraticeesip_volii.pdf.
- Peixoto, M., Pereira, R., Martins, A., Martins, T. & Barbieri, C. (2016). Evidence-based nursing: attitudes, barriers, and practices across care contexts. [Enfermagem baseada em evidência: atitudes, barreiras e práticas entre contextos de cuidados]. In International Journeys of Community Nursing 2016 - Book of communications. https://comum.rcaap.pt/bitstream/10400.26/31753/1/2016_Jornadas26-34.pdf.
- Pérez-Marín, M., Gómez-Rico, I. & Montoya-Castilla, I. (2015). Type 1 diabetes mellitus: psychosocial factors and adjustment of the pediatric patient and his/her family. Review. [Diabetes mellitus tipo 1: factores psicosociales y adaptación del paciente pediátrico y su familia. Revisión] *Archivos Argentinos Pediatría*, 113(2), 158-162. <https://dx.doi.org/10.5546/aap.2015.158>.
- Pires, A., Aparícia, G. & Duarte, J. (2016). Validation study of the scale child's satisfaction with the diabetes nursing consultation. *Millennium*, 2(1), 41-50. <https://revistas.rcaap.pt/millennium/article/view/13913>.
- Ramos, A. & Figueiredo, M. (2020). Child and Youth Health Nursing. Lidel.

Regulation no. 422/2018. Republic Diary II Series. 133 (2018-07-12) 19192-19194.
Available on WWW:
<<https://www.ordemenfermeiros.pt/media/8349/1919219194.pdf>>.

Portuguese Society of Diabetology. (2016). Diabetes: Facts and Figures – The Year 2015. Annual Report of the National Diabetes Observatory. <https://www.spd.pt/images/bolsas/dfn2015.pdf>.

Wang, Y., Brown, S. & Horner, S. (2013). The school-based lived experiences of adolescents with type 1 diabetes. *The Journal of Nursing Research*, 21(4), 235-242. <https://doi.org/10.1097/jnr.0000000000000003>.

Zanatta, E., Scaratti, M., Argenta, C. & Barichello, A. (2020). Experiences of adolescents with type 1 diabetes. *Revista de Enfermagem Referência*, (4), 1-7. <https://doi.org/10.12707/RV20044>.

Bionotes

Eduarda Vieira is a Nurse and Student the Master of Nursing Specialist in Children and Paediatric Health at the São José de Cluny School of Nursing and Santa Maria Health School.

Email: edusavieira@hotmail.com

Orcid: 0000-0001-6406-6453

Ana Viveiros is a Nurse and Student the Master of Nursing Specialist in Children and Paediatric Health at the São José de Cluny School of Nursing and Santa Maria Health School.

Email: anaviveiros96@hotmail.com

Orcid: 0000-0002-8067-4237

Joana Fonseca is a Nurse and Student the Master of Nursing Specialists in Children and Paediatric Health at São José de Cluny School of Nursing and Santa Maria Health School.

Email: joanafons@gmail.com

Orcid: 0000-0001-8020-6727

Goreti Marques is Coordinating Professor at Santa Maria Health School and researcher at CINTESIS.

Email: goreti.marques@santamariasauade.pt

Orcid: 0000-0002-1342-4916

Olívia Barcelos is Adjunct Professor at São José de Cluny School of Nursing and researcher of nursing studies.

Email: mbarcelos@esesjcluny.pt

Orcid: 0000-0001-6311-9429

Rita Fernandes is Adjunct Professor at Nursing School of Porto and researcher at CINTESIS.

Email: ritafernandes@esenf.pt

Orcid: 0000-0002-9870-2128

Received: December 2022

Published: December 2023