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Original article

Social and clinical profile of children and adolescents with type 1 diabetes mellitus *

Perfil social e clínico de crianças e adolescentes com diabetes mellitus tipo 1

Perfil social y clínico de niños y adolescentes con diabetes mellitus tipo 1

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Abstract

Objective: to identify the social and clinical profile of children and adolescents with type 1 diabetes mellitus. **Method:** quantitative, cross-sectional and descriptive research, developed with 81 guardians of children and adolescents with type 1 diabetes mellitus between March and September/2021, in two reference centers in Paraíba. The descriptive analysis was performed using the Statistical Package for the Social Science software, version 18. **Results**: predominantly, the companions of the children and adolescents were the mothers themselves, 90.1%, and about 40% lived with family income lower than a minimum wage. Among the children and adolescents, 54% had high glycated hemoglobin values, even though they were undergoing treatment; 65.4% indicated ignorance of the correct form of insulin storage, and 77.6% had lipohypertrophy. **Conclusion**: socioeconomic vulnerability and ineffective clinical management of type 1 diabetes mellitus in children and adolescents were predominant.

Descriptors: Diabetes Mellitus, Type 1; Child; Adolescent; Health Profile; Pediatric Nursing

Resumo

Objetivo: identificar o perfil social e clínico de crianças e adolescentes com diabetes mellitus tipo 1. **Método:** pesquisa quantitativa, transversal e descritiva, desenvolvida com 81 responsáveis de crianças e adolescentes com diabetes mellitus tipo 1 entre março e setembro/2021, em dois centros de referência da Paraíba. A análise descritiva foi realizada com auxílio do software *Statistical Package for the Social Science*, versão 18. **Resultados**: predominantemente, os acompanhantes das crianças e adolescentes eram as próprias mães, 90,1%, e cerca de 40% viviam com renda familiar menor que um salário mínimo. Entre as crianças e adolescentes, 54% apresentaram valores elevados de hemoglobina glicada, mesmo estando em tratamento; 65,4% indicaram desconhecimento na forma correta de armazenamento da insulina, e 77,6% possuía lipohipertrofia. **Conclusão**: foram preponderantes a vulnerabilidade socioeconômica e o manejo clínico ineficaz do diabetes mellitus tipo 1 em crianças e adolescentes.

Descritores: Diabetes Mellitus Tipo 1; Criança; Adolescente; Perfil de Saúde; Enfermagem Pediátrica

Resumen

Objetivo: identificar el perfil social y clínico de niños y adolescentes con diabetes mellitus tipo 1. **Método:** investigación cuantitativa, transversal y descriptiva, realizada con 81 cuidadores de niños y adolescentes con diabetes mellitus tipo 1 entre marzo y septiembre/2021, en dos centros de referencia en Paraíba. El análisis descriptivo fue realizado mediante el software *Statistical Package for Social Science,* versión 18. **Resultados:** predominantemente, los acompañantes de los niños y adolescentes eran sus madres, el 90,1%, y cerca del 40% vivían con renta familiar inferior a un salario mínimo. Entre los niños y adolescentes, el 54% presentaba niveles elevados de hemoglobina glucosilada, a pesar de estar en tratamiento; El 65,4% indicó desconocer la forma correcta de almacenar la insulina y el 77,6% presentaba lipohipertrofia. **Conclusión:** predominó la vulnerabilidad socioeconómica y el manejo clínico ineficaz de la diabetes mellitus tipo 1 en niños y adolescentes.

Descriptores: Diabetes Mellitus Tipo 1; Niño; Adolescente; Perfil de Salud; Enfermería Pediátrica

Introduction

Type 1 diabetes mellitus (T1DM) is an endocrine-metabolic disease prevalent in childhood and adolescence, characterized by persistent hyperglycemia. This condition occurs due to the deficiency in the production of insulin by the pancreas and the consequent need for exogenous replacement of this hormone to obtain glycemic control.[1] It is considered an important public health problem that affects thousands of children and adolescents annually. On the world stage, it is estimated that about 1.52 million children and adolescents are diagnosed with DM1, and Brazil ranks third in the ranking of countries with the highest number of this population.[2.]

The repercussions caused by T1DM occur due to the changes and demands of its treatment, which can have negative effects on quality of life, considering the social and emotional discomfort generated in children, adolescents and their families.[3] Therefore, by knowing the reality experienced by this public and the factors that interfere with the management of the disease, it becomes possible to provide timely and individualized care.

When the daily tasks of self-care, required by treatment, occur in a fragile manner, the management of the disease can become unsatisfactory. The results involving the clinical aspects of children and adolescents with T1DM, such as the altered glycemic value caused by the incorrect application of insulin and inadequate monitoring of serum glucose, are considered important information for decision making in health care.[4]

Socioeconomic factors, such as educational level, income, employment and parental style, directly interfere with the management of the disease and the quality of life of this population. Additionally, the high rate of premature death and complications resulting from DM1 are related to unfavorable socioeconomic conditions, such as unemployment and low income, and this reality is even more evident in developing countries. [2,5]

The failure to seek care and the difficulty of access and, consequently, of support by health professionals can generate gaps in relation to the care provided by families, especially those living in situations of social vulnerability. These obstacles contribute to unsatisfactory metabolic control, which may increase the risk of serious complications[5] and lead to unnecessary hospitalizations. Faced with this problem, the objective was to identify the social and clinical profile of children and adolescents with T1DM.

Method

Research with a quantitative, cross-sectional and descriptive approach, guided by *the* Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), linked to the macro-project “Quality of life, clinical and sociodemographic profile of children and adolescents with type 1 diabetes mellitus: a multicenter study”.

Data collection was carried out from March to September 2021, in person and/or remotely, due to the context of the COVID-19 pandemic and its restrictions, in two reference outpatient clinics for chronic and rare diseases in the state of Paraíba.

The sample obtained was probabilistic and not for convenience. The average number of consultations was 10 visits per week, and about 101 young patients with diabetes made up the register of health services elected for the development of the research. The recruitment of this public occurred through a list made available by the medical team, with information about the diagnosis, in addition to periodic visits of researchers to health services.

Children and adolescents with T1DM could be of both sexes, aged between two and 18 years incomplete, with a minimum time of diagnosis of six months, in outpatient follow-up in the last year. The choice of the age group of children and adolescents was based on the concept of the Statute of Children and Adolescents (ECA), whose law defines children as persons up to twelve years of age incomplete, and adolescents as those between 12 and 18 years of age.[6]

Children and adolescents with T1DM who met the following criteria were considered: hyperglycemia documented by one of the following tests: fasting blood glucose ≥ 126mg/dl; oral glucose tolerance test (OGTT) ≥ 200 mg/dl; HbA1c ≥ 6.5% (documented); capillary blood glucose ≥ 200 mg/dl and symptomatic; history of hyperglycemia consistent with diabetes if there are no laboratory tests at diagnosis.[7] Children and adolescents who had a record of care but failed to follow up at the service were excluded from the study, and those diagnosed with other types of diabetes, such as adult latent autoimmune diabetes (ALAD), diabetes *insipidus*, neonatal diabetes or Maturity Onset Diabetes of the Young (MODY). Legal guardians over 18 years of age were included.

However, sixteen did not participate because they did not attend the outpatient clinic on the day of the previously scheduled medical appointment, as well as for the application of the research instrument. Others did not answer the researchers' calls so that the interviews that were scheduled for remote collection could be conducted, even with the day and time previously agreed by the messaging application, according to their availability.

Among the 85 eligible participants, four guardians refused to participate due to unavailability and/or fear of disclosing the requested information, despite the guarantee of anonymity. Therefore, 81 legal guardians of children and adolescents with T1DM participated in the study.

Data collection was carried out by two previously trained researchers, who surveyed children and adolescents with T1DM, attended in the last year in both outpatient clinics.

In the face-to-face form, the recruitment and acquisition of data took place in the outpatient clinics themselves, respecting the patients' follow-up schedules. The consent of the guardians and the consent of the children and adolescents were also obtained in person. The interviews were conducted in a place reserved for this purpose, usually in the nursing office, preserving the privacy of the participants.

When performed remotely, the contact occurred by telephone, via the researchers-interviewers' own device. The electronic address linked to Google Forms, as well as the “Informed Consent Form” (ICF), to be signed virtually, were made available to participants through an instant messaging application. Subsequently, the signed ICF was sent to the research participant by e-mail. In these cases, the researchers completed the questionnaire of the clinical and sociodemographic profile, based on the answers provided by the legal guardians of the children and adolescents, during the interview.

Authorization was also requested from the person responsible for consulting the medical record to obtain additional information, for example: results of laboratory tests or complications due to the disease. The form used consisted of 76 questions that included questions about the sociodemographic profile of the family and patient and the clinical profile, such as data on time of diagnosis, insulin therapy, glycated hemoglobin result, acute and long-term complications. Due to the lack of a form of this nature validated in Brazil, the data collection instrument was prepared by the research team of the multicenter study, which had the experience of three diabetes educators, based on the relevant literature and the objectives of the study.

It is noteworthy that the duration of each interview was approximately 40 minutes and the presence of the children and youth public with the responsible, at the time of application of the form. The data collected were coded and tabulated in a spreadsheet in the Microsoft Office Excel® computer software, with the collaboration of an expert in the area. They were then compiled and analyzed with the help of the Statistical Package for the Social Sciences software version 18. Descriptive statistics of the variables studied were performed through absolute and relative frequencies. The data were treated and presented in tables corresponding to the processed analyses.

The study followed the guidelines of Resolution 466/2012 of the National Health Council, obtaining a favorable opinion in the proposing institutions number 005327/2020 and CAAE: 28312919.2.1001.0121 and amendment number 4,556,497 and CAAE: 28312919.2.3005.5186. All participants signed the ICF.

Results

The sample of this study consisted of 81 guardians of children and adolescents with T1DM. Predominantly, the guardians were the mothers themselves (n=73; 90.1%), who exercised the occupation of housewife (n=40; 49.4%), whose highest percentage of education was complete high school (n= 28; 34.6%) (Table 1).

The highest percentage of mothers were married (n= 45; 55.6%) and 23.5% (n=19), had a stable union; 40.7% (n=33) lived with a family income of less than one minimum wage, and 58% (n=47) lived in a household with three or four more people besides the child or adolescent (Table 1).

Table 1 - Social characteristics of the guardians/caregivers of children and adolescents with type 1 diabetes mellitus in two reference clinics. João Pessoa, PB, Brazil, 2021 (N=81)

Variables	n (%)
Relationship with the child/adolescent	
Mother	73 (90.1)
Father	2 (2.5)
Grandmother	4 (5)
Aunt	1 (1.2)
Spouse	1 (1.2)
Employment Status	
Housewife	40 (49.4)
Unemployed	5 (6.2)
Retiree	3 (3.6)
Self-employed	17 (21.0)
Formal Worker	16 (19.8)
Education level	
Complete elementary education	12 (14.8)
Incomplete elementary education	20 (24.7)
Complete high school	28 (34.6)
Incomplete high school	10 (12.3)
Complete university education	11 (13.6)
Marital status	
Single	7 (8.6)

Married	45 (55.6)
Separated undeclared	7 (8.6)
Stable union	19 (23.5)
Divorced	2 (2.5)
Widowed	1 (1.2)
monthly family income (minimum wages) *	
Less than 1 minimum wage	33 (40.7)
Between 1 and 1.5	26 (32.1)
Between 2 and 2.5	15 (18.6)
Between 3 and 3.5	4 (4.9)
Between 4 and 4.5	3 (3.7)
Members of the household other than the child/adolescent	
One	4 (4.9)
Two	21. 26
From three to four	47-58.
From five to six	5 (6.2)
Above six	4 (4.9)

Among children and adolescents with T1DM, the predominant sex was female (n=43; 53.1%), aged between 13 and 17 years (n=33; 40.7%), skin color white (n=39; 48.1%), followed by brown race (n=38; 46.9%). Mosto f them were enrolled in elementary school (n=64; 85.4%) (Table 2).

Commonly, children and adolescents performed follow-up only in a public outpatient clinic (n=70; 86.5%), while 4.9% (n=4) also performed follow-up in a private service and in primary care (n=7; 8.6%). For the acquisition of inputs, it was found that n=69 (85.2%) received these materials in the public network, and 9.9% (n=8) acquired them in a complementary way in the private network (Table 2).

Table 2 - Social characteristics of children and adolescents with type 1 diabetes mellitus in two reference clinics. João Pessoa, PB, Brazil, 2021 (N=81)

Variables	n (%)
Sex	
Male	38 (46.9)
Female	43 (53.1)
Color or ethnicity	
White	39 (48.1)
Brown	38 (46.9)
Yellow	2 (2.5)
Indigenous	2 (2.5)
Age group	
2 to 4 years	8 (9.9)

5 to 8 years	17 (21.0)
9 to 12 years	23 (28.4)
13 to 17 years	33 (40.7)
Education level (n=75)	
Incomplete primary education	64 (85.4)
Incomplete high school	10 (13.3)
Incomplete university Education	1 (1.3)
Follow-up location	
Public outpatient clinic	70 (86.5)
Public and private outpatient clinic	4 (4.9)
Public outpatient clinic and primary care	7 (8.6)
Place that acquires the inputs	
Public network	69 (85.2)
Private Networks	4 (4.9)
Both public and private:	8 (9.9)

Regarding family history with diabetes, 84% (n=68) of children and adolescents had a father or mother without the disease. In addition, 93.8% (n=76) of these children/adolescents also had siblings without T1DM (Table 3).

Most children and adolescents had been diagnosed with T1DM up to two years before the day of data collection (n=37; 45.7%). At the time of diagnosis, the main clinical manifestations corresponded to persistent hyperglycemia with associated signs and symptoms (n= 66; 81.5%) and that 13.6% (n=11) had diabetic ketoacidosis (DKA). Predominantly, in the investigated group, the most recent HbA1c result was >8.5% (n=34; 54%), and the children/adolescents had no kidney disease or macrovascular disease (n= 77; 95.1%), morbidities associated with T1DM (Table 3).

Table 3 - Clinical aspects of children and adolescents with type 1 diabetes mellitus in two reference clinics. João Pessoa, PB, Brazil, 2021 (N=81)

(Continua)

Variables	n (%)
Family history of diabetes mellitus	
Mother with T1DM	1 (1.2)
Mother with T2DM	7 (8.6)
Father with T1DM	1 (1.2)
Father with T2DM	4 (5)
Nobody has diabetes	68 (84)
Siblings with T1DM	
None	76 (93.8)
One	3 (3.7)
More than two	2 (2.5)
Time since diagnosis	
Up to 2 years	37 (45.7)

From 3 to 5 years	28 (34.6)
From 6 to 9 years	9 (11.1)
More than 10 years	7 (8.6)
Clinical status at diagnosis	
Hyperglycemia with signs and symptoms	66 (81.5)
Diabetic ketoacidosis	11 (13.6)
Asymptomatic	3 (3.7)
Hormonal change	1 (1.2)
Result of glycated hemoglobin (n=63)	
< 5.7	6 (9.5)
≥5.7 and <6.5%	2 (3.2)
≥6.5 and <7.5%	8 (12.7)
≥7.5 and ≤8.5%	13 (20.6)
>8.5%	34 (54)
Complications of T1DM	
No	77 (95.1)
Renal disease	3 (3.7)
Macrovascular disease	1 (1.2)

For insulin therapy, the rechargeable pen for the application of basal insulin (n=44; 54.3%) and the disposable pen for the application of insulin *bolus* (n=55; 70.5%) were used. Only 1.2% (n=1) of the children and adolescents used the insulin pump, and 17.3% (n=14) applied insulin with a syringe (Table 4).

The most commonly used long-acting (basal) insulin was Lantus (n=55; 68%), followed by NPH (n=24; 29.6%), and fast-acting (*bolus*) insulin was Novorapid (n=53; 68.8%). As for the daily frequency of basal insulin application, it was observed that the majority performed once a day (n=56; 59.6%), and as for insulin *bolus,* 58.4% (n=45), applications occurred from three to four doses per day (Table 4).

Table 4 - Aspects related to insulin therapy of children and adolescents with type 1 diabetes mellitus in two reference clinics. João Pessoa, PB, Brazil, 2021 (N=81)

(continua)

Variables	**n (%)**
Basal insulin device	
50IU insulin syringe	1 (1.2)
100IU Insulin syringe	5 (6.2)
Syringe with 100IU needle attached	8 (9.9)
Disposable pen	22 (27.2)
Rechargeable pen	44 (54.3)
Insulin pump	1 (1.2)
Insulin *bolus* device (n=77)	
50IU insulin syringe	1 (1.3)
100IU Insulin syringe	2 (2.6)

Syringe with 100IU needle attached	8 (10.4)
Disposable pen	55 (71.4)
1IU Rechargeable pen	10 (13)
0.5IU Rechargeable pen	1 (1.3)
Basal insulin used	
NPH	24 (29.6)
Lantus	55 - 68
TRESIBA	1 (1.2)
Ultra-fast-acting insulin	1 (1.2)
Insulin *bolus* used (n-=77)	
Regular	21 (27.3)
Apidra	2 (2.6)
Humalog	1 (1.3)
Novorapid	53 (68.8)
Daily frequency of basal insulin application (n=80)	
Once	56–70
Twice	21 (26.3)
Three times	2 (2.5)
Four times	1 (1.2)
Daily frequency of insulin *bolus* application (n=77)	
1-2 times	19 (24.7)
3-4 times	45 (58.4)
5 to 6 times	14 (16.9)

Insulin is self-administered by 65.4% (n=53) of children and adolescents from the age of seven. Supervision of this care by the guardian is not performed in 56.6% (n=30) of adolescents. Regarding the rotation of the insulin application site, it was evidenced that 37.1% (n=30) of children/adolescents use three rotation sites, and 44.4% (n=36) have lipohypertrophy (self-reported) in at least one of these application sites (Table 5).

Insulin in use is maintained in a continuous refrigeration system by about 65.4% (n=53) of individuals. Of these, 34% (n=18) stored on the middle shelf of the refrigerator and 20.8% (n=11) on the refrigerator door (Table 5).

Table 5 - Distribution of frequencies of variables related to insulin therapy in children and adolescents with type 1 diabetes mellitus in two reference clinics. João Pessoa, PB, Brazil, 2021 (N=81)

(continua)

Variables	n (%)
Self-application by the child/adolescent	
Yes	53 (65.4)
No	28 (34.6)
Adult-supervised self-application (n=53)	
Yes	23 (43.4)

No	30 (56.6)
Rotation of application sites	
One	12 (14.8)
Two	27 (33.3)
Three	30 (37.1)
Four or more	12 (14.8)
Locations with lipohypertrophy	
None	45 (55.6)
One	28 (34.6)
Two	7 (8.6)
Three	1 (1.2)
Storage of insulin in use	
Refrigerator	53 (65.4)
Outside of the refrigerator but protected from sunlight	28 (34.6)
Location of storage in the refrigerator (n=53)	
Upper shelf	16 (30.2)
Middle shelf	18 (34)
Bottom shelf	8 (15)
On the refrigerator door	11 (20.8)

Discussion

The social and clinical profile of children and adolescents with T1DM is intrinsically related to the way family and children manage the disease.[8] In this study, most caregivers completed high school. Due to the complexity of diabetes treatment and its requirements, education is a predictive factor for the proper management of children, adolescents and their guardians. Reading, writing and comprehension skills allow better management of the care routine and the conditions experienced by children and adolescents with this endocrine-metabolic alteration.[8]

The results of this research show the low income of families, since most lived with less than one minimum wage, and the number of household members was three to four family members. Corroborating these findings, the National Household Sample Survey of the Brazilian Institute of Geography and Statistics says that, in 2021, the nominal monthly household income *per capita* of the population residing in Paraíba was 826 reais,[8] below the minimum wage in Brazil, which was R$1,100.00.[9] This reality contributes to the development of stressors, caused by the situation of financial difficulty and the unavailability of resources that make the well-being of children with T1DM unfeasible.[10]

A study conducted in the United States showed that the family economic class can interfere with glycemic control. The lower the socioeconomic level, the more susceptible individuals are to poor glycemic control and, consequently, to complications of T1DM.[11]

Research indicates that the absence of family history with T1DM may be a risk factor for late diagnosis and acute complications, due to the lack of recognition of common manifestations of the disease by previous experiences.[3]

A clinical investigation with 274 children with T1DM in Paraná revealed that only 1.8% of fathers, 1.1% of mothers and 4.4% of children's siblings had T1DM. The results state that the ability of family history to be a protective factor is limited, since it was only present when one or more siblings had T1DM.[12]

The condition of vulnerability that T1DM imposes, provides the triggering or worsening of other comorbidities, due to chronic hyperglycemia, that is, when there is poor control, which interferes with the inflammatory process and the immune response of the individual, making him more vulnerable against pathogens and stressors.[2] However, a study developed in the diabetes centers of Italy contacted a low prevalence of coronavirus infection in children/adolescents with T1DM.[13] Because they are individuals with chronic disease and that make up the risk group, prevention measures and social isolation among families may have been rigorously implemented, thus decreasing infection rates.[14]

Among the signs and symptoms at the time of diagnosis of T1DM, there was a predominance of chronic hyperglycemia. This finding corroborates the literature, whose signs and symptoms reported by those responsible for confirming the diagnosis usually include polydipsia, polyuria, polyphagia and weight loss.[1,3,5] Nevertheless, some participants report the occurrence of CAD, which presupposes the late confirmation of T1DM in this audience. In general, CAD can be avoided, but the lack of knowledge and weaknesses related to the identification of signs and symptoms characteristic of persistent hyperglycemia make diagnosis and treatment difficult.[12]

In the treatment of children and adolescents with T1DM, it is recommended to set goals for HbA1c individually. The HbA1c result of 7% is considered adequate for many children, and 7.5% for those who present symptoms of hypoglycemia during HbA1c control, as well as for those who do not have access to insulin analogues, to continuous administration and monitoring technologies or with non-glycemic factors that increase HbA1c.[1] However, in the present study, 54% of children and adolescents had HbA1c >8.5%, which represents difficulty in maintaining glycemic control and, consequently, a higher risk of developing complications.[2]

A study conducted in two university hospitals in Bahia, with 84 children undergoing treatment, showed that 80.9% had HbA1c levels above the reference values and that there is a negative association between glycemic control, unfavorable socioeconomic situation and psychological status. This reality is justified by the fact that groups with lower socioeconomic status have greater difficulty in terms of the resources needed for treatment.[5]

For the insulin therapy of this public, the use of a pen-type device was commonly noted, and one patient used the continuous insulin infusion system (SICI), insulin pump. It was also observed that an important portion of the participants used a syringe for insulin application, eight (10.4%) with attached needle syringes. The pens, when compared to the syringes, have greater precision and safety in the application, as well as better adherence to treatment by less painful applications. In addition, they are easier to handle and enable transport without refrigeration.[1]

In the case of the use of SICI, the benefits are related to the infused insulin dosages, which resembles what would be offered physiologically, in addition to providing comfort by reducing the need for multiple injections daily.[15]

Among these aspects, there was a predominance of the administration of a daily dose of basal insulin and three to four times the application of insulin *bolus*. A controlled clinical trial by the Diabetes Control and Complications Trial Research Group (DCCT), which began in 1994 and continues to this day, reveals that treatment with three or more doses of insulin with both types of action or by SICI allows greater glycemic control and a lower risk for chronic complications.[16] Despite this, it is noted that a portion of the investigated group still uses insulin *bolus* only once or twice a day, which can make it difficult to achieve good glycemic control.

Insulin self-administration without adult supervision has been adopted by the majority of children/adolescents in this study. However, the protagonism of children/adolescents in the development of self-care and self-efficacy must occur through the support of the family.[17] Therefore, it is essential to monitor self-care tasks by a family member and/or health professional to ensure compliance with technical guidelines and the proper management.

An important step in the insulin application technique to be performed is the rotation of the insulin application sites, which provides the safe and effective treatment of T1DM by reducing the risks of lipohypertrophy and, consequently, contributing to better insulin absorption.[1] In this population, 36 cases of self-reported lipohypertrophy were identified, with the majority performing insulin application only in three recommended sites, another factor that can hinder glycemic control. A study conducted in India pointed out that factors related to the technique of inadequate application, high levels of pro-inflammatory cytokines and anti-insulin antibodies were associated with the appearance of lipodystrophies and that the concentration of HbA1c was higher in these cases.[18]

The storage of insulin is also an important factor. According to the recommendations of the manufacturers of the application devices, the pens in use do not require refrigeration and must be kept at room temperature, protected from light and heat. Storage in the refrigerator may pose risks to the internal mechanism of the device and, consequently, errors in the administration of the dose.[7,19]

Therefore, it is possible to infer that most of this public kept insulin in an inappropriate place, that is, there is a lack of knowledge regarding its packaging, which can compromise the therapy of the disease due to the interferences caused in the medication. In this sense, educational actions are necessary to guide this practice to this public and its families.[20-21]

It is desirable that managers and health professionals be attentive to the realization of diabetes education actions in their Health Units, for parents or guardians about the management of T1DM in children and adolescents. Thus, it will be possible to contribute to understanding the management of this morbidity, minimize the mistakes made and obtain better clinical outcomes as HbA1c results within the recommendations to prevent long-term complications, prevention of CAD, reduction of cases of lipohypertrophy and adequate storage of insulin.

Due to the pandemic scenario, the limitations of this study are listed, which, in some cases, made it impossible to apply the data collection instrument remotely, since the difficulty in the management of technologies by the participants reduced their adherence. In addition, in the face-to-face format, access to this public was restricted, due to the reduction in the number of consultations made available by the care services and/or non-attendance of these individuals in routine consultations, which caused the compromise of the sample.

Identifying the social vulnerability and the lack of good control of T1DM in children and adolescents, even being under treatment for this morbidity, shows that updates of care protocols, public policies focusing on this population and qualification of care through training courses related to the management of this morbidity for professionals and families of these children and adolescents are necessary.

Conclusion

The present study identified the social and clinical profile of children and adolescents with T1DM. It found low socioeconomic status through access to family income, showing social vulnerability of these children and adolescents. This is worrying, since it can negatively influence the management of the disease.

Although the majority of children and adolescents undergo treatment with a *basal-bolus* regimen with multiple doses, it can be evidenced that part of this group of participants is not performing the treatment according to the current recommendations. These have used the scheme of isolated human insulins, and this, associated with other factors, could justify the high values of glycated hemoglobin in the sample studied.

Regarding the management of insulin therapy, there was a predominance of ignorance regarding the correct form of insulin storage. Although most have the pen device, part of this group remains using syringes with attached needle, which can offer risks regarding the correct application of dosages and the involvement of lipohypertrophy. By knowing these conditions and their influence on the management of T1DM, it becomes possible to set individualized and assertive goals in health care, in order to assist in the formulation of public policies aimed at the demands of this population.

These findings may contribute to the implementation of comprehensive care, considering the specific social and clinical needs of the individual-family. This knowledge will support the development of diabetes education by health professionals based on the weaknesses of the public, contributing to the longitudinality of care and the management of T1DM.

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