

## Characterization of adolescents with diabetes mellitus attended in ambulatory of teaching hospital

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Caracterización de adolescentes con diabetes mellitus atendidos en ambulatorio de hospital de ensino

Caren da Silva Bertoldo<sup>I</sup>, Júlia Heinz da Silva<sup>II</sup>, Andressa da Silveira<sup>III</sup>  
Aline Cammarano Ribeiro<sup>IV</sup>, Jaquiele Jaciara Kegler<sup>V</sup>, Eliane Tatsch Neves<sup>VI</sup>

**Abstract: Objective:** to characterize the sociodemographic and clinical profile of adolescents with diabetes mellitus attended in an outpatient clinic of a teaching hospital. **Method:** exploratory descriptive research with quantitative approach. Data was analyzed using descriptive statistics. **Results:** 45 medical records of adolescents were analyzed, most of them male (53.3%), diagnosed with type I diabetes mellitus (95.6%), and demand for medication care associated with modified habitual care (73.4%), 90.7% of them was using insulin, and 68.9% who already needed hospitalization. All were followed up with in specialized clinics. We emphasized the search for emergency services over than primary health care. **Conclusions:** The sociodemographic and clinical characterization of these adolescents pointed out the continuous demands of care that adolescents need to maintain their health. Therefore, it is important to follow-up the adolescents, in order to help them in the process of coping with the disease.

**Descriptors:** Adolescent; Diabetes mellitus; Adolescent health; Nursing; Ambulatory care

**Resumo: Objetivo:** caracterizar o perfil sociodemográfico e clínico de adolescentes com diabetes mellitus atendidos em ambulatório de um hospital de ensino. **Método:** pesquisa descritiva exploratória com abordagem quantitativa. Os dados foram analisados por meio da estatística descritiva. **Resultados:** analisaram-se 45 prontuários de adolescentes, sendo a maioria do sexo masculino (53,3%), com diagnóstico de diabetes mellitus tipo I (95,6%), demanda de cuidado

<sup>I</sup> Nurse, Masters in Nursing, Federal University of Santa Maria, Santa Maria, RS, Brazil. E-mail: carensbertoldo@gmail.com ORCID: <https://orcid.org/0000-0002-0199-134X>

<sup>II</sup> Nurse, PhD Candidate in Nursing, Federal University of Santa Maria, Santa Maria, RS, Brazil. E-mail: juheinzs@gmail.com ORCID: <https://orcid.org/0000-0003-3169-0764>

<sup>III</sup> Nurse, Adjunct Professor in the Undergraduate Course of Nursing, PhD in Nursing, Federal University of Santa Maria Palmeira das Missões campus, Palmeira das Missões, RS, Brazil. E-mail: andressadasilveira@gmail.com ORCID: <https://orcid.org/0000-0002-4182-4714>

<sup>IV</sup> Nurse, Adjunct Professor in the Undergraduate and Graduate courses of Nursing, PhD in Nursing, Federal University of Santa Maria, Santa Maria, RS, Brazil. E-mail: alinecammarano@gmail.com ORCID: <https://orcid.org/0000-0003-3575-2555>

<sup>V</sup> Nurse, PhD Candidate in Nursing, Federal University of Santa Maria, Santa Maria, RS, Brazil. E-mail: jake\_kegler93@hotmail.com ORCID: <https://orcid.org/0000-0003-0001-9564>

<sup>VI</sup> Nurse, Associate Professor in the Department of Nursing and Permanent Professor in the Graduate Program in Nursing, PhD in Nursing and Post Doctoral studies in Public Health, Federal University of Santa Maria, Santa Maria, RS, Brazil. E-mail: eliane.neves@ufsm.br ORCID: <https://orcid.org/0000-0002-1559-9533>

medicamentosa associada ao cuidado habitual modificado (73,4%), em uso de insulina (90,7%) e que já necessitaram internação no hospital do estudo (68,9%). Todos estavam em acompanhamento com médico especializado. Destacou-se a procura por serviços de emergência em detrimento da atenção primária. **Conclusões:** a partir da caracterização sociodemográfica e clínica desses adolescentes observaram-se as demandas contínuas de cuidado que o adolescente necessita para manutenção de sua saúde. Para tanto é importante a realização de acompanhamento periódico, no sentido de auxiliar o adolescente no processo de enfrentamento da doença.

**Descritores:** Adolescente; Diabetes mellitus; Saúde do adolescente; Enfermagem; Assistência ambulatorial.

**Resumen: Objetivo:** caracterizar el perfil sociodemográfico y clínico de adolescentes con diabetes mellitus atendidos en ambulatorio de un hospital de enseñanza. **Método:** investigación descriptiva exploratoria con enfoque cuantitativo y análisis estadística descriptiva. **Resultados:** fueron analizados 45 prontuarios de adolescentes, la mayoría del sexo masculino (53,3%), diagnóstico de diabetes mellitus tipo I (95,6%), demanda de cuidado medicamentosa asociada al cuidado habitual modificado (73,4%), en uso de insulina (90,7%) y ya han sido internados en el hospital (68,9%). Todos estaban en seguimiento con médico especializado. Se destacó la demanda de servicios de emergencia en comparación con los de la atención primaria. **Conclusiones:** por medio de la caracterización sociodemográfica y clínica de los adolescentes fue posible observar las demandas continuas de cuidado que ellos necesitan para el mantenimiento de la salud. Es importante la realización de seguimiento periódico, en el sentido de auxiliar al adolescente en el proceso de enfrentamiento de la enfermedad.

**Descriptor:** Adolescente; Diabetes mellitus; Salud del adolescente; Enfermería; Asistencia ambulatoria

## Introduction

Adolescent, which comprehends the age gap between 12 and 18 years old<sup>1</sup> according to the Statute of Child and Adolescent (ECA), and between 10 anos and 19 according to the World Health Organization (WHO),<sup>2</sup> is considered as a phase in the human development since the 20th century.<sup>3</sup> Since then, singular characteristics were attributed to this phase, such as physical, emotional, psychic, hormonal and social changes.<sup>4</sup> Thus, the adolescent is susceptible to adhere unhealthy life styles, such as sedentarismo and inadequate diet. There are also genetic and environmental factors that contribute to weight gain and the occurrence of diabetes mellitus.<sup>5</sup>

Diabetes mellitus was the cause of 56.987 hospitalizations in the population between 10 and 19 years old from January 2008 to March 2018 in Brazil,<sup>6</sup> and it is one of the most recurrent chronic illnesses in the adolescent population. Diabetes Mellitus treatment includes nutrition, glycemetic control, medication and physical exercises.<sup>7</sup> Therefore, children and adolescents with diabetes mellitus are part of a group called children with special health care needs (CSHCN).<sup>8</sup>

Children and adolescents that live with chronic health conditions and need care beyond usual of those in the same age range belong to this group.

Care demands of these users were categorized according to demands arising from the diagnosis such as medication, technological, usual modified, neuropsychomotor and mixed care, when all of these are combined.<sup>9</sup> Demand for medication care includes those users who use continuous medication. Demand for technological care refers to the use of life-sustaining technologies or biological activities. Modified usual care includes all everyday changes related to the disease and neuropsychomotors refer to any sensory or developmental changes.<sup>9</sup>

All of these factors can interfere with the routine of adolescents and their families. It is essential to have different sources of social support, health education, promotion of adolescent independence for the development of their care, and acceptance of the diagnosis.<sup>10-11</sup> Thus, nursing stands out as an important source of support for overcoming obstacles in living with diabetes mellitus, since, through health education, nurses share knowledge in order to empower adolescents and make them co-responsible in decision-making.<sup>12</sup>

Given the above, knowing the sociodemographic and clinical characteristics of adolescents with diabetes mellitus seen at an outpatient teaching hospital enables nursing professionals to act in preventing the disease and minimizing the problems, since early diagnosis and treatment reduce the damage caused by it.<sup>13</sup> Also, a bigger knowledge about the theme assists health professionals on elaborating a integral health care plan for the adolescent with diabetes mellitus, contributing, thus, to systematization of care and developing it to strengthen adherence to treatment.

So, research question was: what are sociodemographic and clinical characterizations of adolescents with diabetes mellitus assisted in a teaching hospital outpatient unit? From it, we proposed the aim: to characterize the sociodemographic and clinical profile of adolescents with diabetes mellitus treated at an outpatient clinic of a teaching hospital.

## Method

Exploratory Descriptive Research, with quantitative approach, developed in a teaching hospital in the central region of Rio Grande do Sul (RS), Brazil. This is a section of the matrix project database entitled “Empowerment of adolescents with special health needs”. Its specific aim is to analyze the profile of adolescents assisted on a teaching hospital outpatient unit in 2016.

The instrument used to collect data was constructed by the Project authors and had variables to trace the sociodemographic, birth and clinical profile of these adolescents. The selection criteria were all adolescents aged 12 to 18 years,<sup>1</sup> with at least one consultation in the year of 2016.

To develop the present research, we used the matrix Project database. Between the months of September and October 2017, we selected only adolescents with diabetes mellitus type I and II. Also, we analyzed only sociodemographical and clinical variables of these adolescents, because only one participant was born at the studied hospital, thus, only one had birth variables described in the medical records. Sociodemographical variables included information such as sex, age, city of birth and origin. Clinical variables included diagnosis, care demands, time they were being assisted, professional that assisted him/her, referrals received, health services accessed during the research year, previous hospitalizations in the study hospital, continuous medications used and limitations presented by the adolescents.

The study included all medical records of adolescents living with diabetes mellitus and consulted at least once in the outpatient clinic of the hospital in question, without performing a sample calculation. Data obtained were organized on *Epi-info*® (version 7.0), with independent double typing. After checking errors and typing inconsistencies, data analysis was performed using the statistical program *R: The R Project for Statistical Computing* (version 3.4.2).

Variables were analyzed using descriptive statistics and their absolute (N) and relative (%) frequencies were presented.

Matrix research was approved by the Research Ethics Committee, under CAAE nº: 57774916.7.0000.5346 and opinion: 1.857.072, on December 08, 2016. In addition, the ethical aspects were preserved by observing the guidelines of Resolution no. 466/12 of the National Health Council, which deals with the Guidelines and Regulatory Norms for Research Involving Human Beings.

## Results

Participated in the research, through their respective medical records, 45 adolescents living with diabetes mellitus type I and II. Data regarding the sociodemographic profile of these adolescents are presented in Table 1.

**Table 1** – Sociodemographic profile of adolescents living with diabetes mellitus treated at an outpatient clinic of a teaching hospital during 2016.

Variables	N	%
<b>Sex</b>		
Female	21	46,7
Male	24	53,3
<b>Age</b>		
12 years old	8	17,8
13 years old	7	15,5
14 years old	6	13,4
15 years old	7	15,5
16 years old	8	17,8
17 years old	9	20,0
<b>Birth</b>		
Northwest of RS*	11	24,5
Central region of RS	31	68,9
Southeast of RS	1	2,2
Southwest of RS	1	2,2
Santa Catarina	1	2,2

<b>Origin</b>		
Northwest of RS	10	22,2
Central region of RS	32	71,1
Southeast of RS	1	2,2
Southwest of RS	2	4,5
<b>Originally from the city of study</b>		
Yes	22	48,9
No	23	51,1

Source: Matrix Project. Note: \*RS = Rio Grande do Sul.

Most of the adolescents were male (N = 24; 53.3%), natural (N = 31; 68.9%) and from (N = 32; 71.1%) of the study. central region of Rio Grande do Sul, and of these, slightly more than half did not live in the city scenario of the study (N = 23; 51.1%). The age that obtained the highest percentage was 17 years (N = 9; 20%). Clinical profile of adolescents is described in Table 2.

**Table 2** – Clinical profile of adolescents living with diabetes mellitus treated at an outpatient clinic of a teaching hospital during 2016.

Variables	N	%
<b>Diabetes Mellitus type</b>		
Diabetes mellitus I	43	95,6
Diabetes mellitus II	2	4,4
<b>Care Demands (N=80)*</b>		
Medication	40	50,0
Habitual modified	34	42,6
Neuropsychomotor	1	1,2
Technological	1	1,2
Mixed*	1	1,2
None	3	3,8
<b>Number of Care Demands</b>		
Nome	3	6,7
One	6	13,3
Two	35	77,8
All	1	2,2
<b>Time of being assisted</b>		
< 5 years	21	46,7
5-10 years	10	22,2

> 10 years	10	22,2
None	4	8,9
<b>Attended other health services</b>		
Yes	14	31,1
No	31	68,9
<b>Attended health services (N=17)*</b>		
Public Health	4	23,6
Urgency/Emergence	8	47,0
Private Services	4	23,6
Specialized clinic	1	5,8
<b>Assited by (N=7)*</b>		
Nutritionist	3	42,9
Social assistance	2	28,5
Occupational therapist	1	14,3
Psychologist	1	14,3
<b>Referrals</b>		
Yes	15	33,3
No	30	66,7
<b>Referrals types (N=16)*</b>		
Exams	6	37,6
Specialist physician	4	25,0
Nutritionist	3	18,8
Physiotherapist	1	6,2
Chemotherapy	1	6,2
Social service	1	6,2
<b>Uses continuous medication</b>		
Yes	43	95,6
No	2	4,4
<b>Was previously hospitalized in the studied hospital</b>		
Yes	31	68,9
No	14	31,1

Souce: Matrix Project. \*Note: Mixed care demand involves having neuropsychomotor, technological, medication and modified care demands at the same time.<sup>9</sup>

\*Note: N value indicated with subtitles on the table are referred on a different somation of the research participants number. In the case of care demands, in some cases, the same adolescente has more than one demand. Attended health services, referrals and referrals types involve cases that this resource was present.

Regarding the variables of the clinical profile of the participants, it was evident that there was a predominance of type I diabetes mellitus (N = 43; 95.6%). Regarding current care demands, the highest percentage presented was drug demand (N = 40; 50.0%), followed by the usual modified (N = 34; 42.6%). It is noteworthy that in this variable we used N = 80, as some

adolescents presented more than one demand, with a predominance of the combination of two demands (N = 35; 77.8%). As for the follow-up period, most adolescents remained under follow-up for less than five years (N = 21; 46.7%).

Regarding the health services attended, only 14 adolescents (31.1%) attended other health services throughout 2016, and among them the most sought after service was urgency and emergency (N = 8; 47.0 %). Still, all adolescents were under the care of specialized physicians (N = 45; 100.0%), with one (N = 31; 68.9%), two (N = 9; 20%) and three (N = 5; 11.1%) doctors. We found records of other types of follow-up, in which it was found that only 7 adolescents (15.5%) were followed by other professionals, especially the nutritionist (N = 3; 42.9%). More than half of the participants did not receive any referrals during their follow-up (N = 30; 66.7%), thus, there were 16 referrals from adolescents to other services, especially exams (N = 6; 37.6%).

Regarding the use of continuous medication, the use of at least one medication was observed (N = 43; 95.6%). Of these adolescents who used medications, there was a predominance of insulin (N = 39; 90.7%), while the rest used other medications (N = 4; 9.3%). Moreover, it was observed that more than half of the participants were already admitted to the hospital where the study was conducted (N = 31; 68.9%).

## Discussion

Among 45 participants, there was little oscilation between the variable sex, with a small male predominance (N = 24; 53.3%). Despite the predominance of males, the frequency of both sexes varied in small numbers, corroborating another study that indicates that although in the global trend of illness there is a predominance of women, when it comes to diabetes mellitus there is no significant gender variation.<sup>14</sup>

Suvey pointed out that just over half of the adolescents do not live in the study city (N = 23; 51.1%) and, therefore, need to travel to access the specialized health service. At the moment



of the idealization of health services, these should be planned to provide greater equity when it comes to the movement of users in the search for care. In addition, the services available throughout the country should also have adequate infrastructure and equipment in order to provide quality assistance to the population. Nevertheless, studies indicate that the Unified Health System (SUS) has in its history high rates of population displacement in search of health care, confirming the data presented in this study. This means that people end up moving from city to city and sometimes even state to ensure health care.<sup>15</sup>

Type I diabetes mellitus was diagnosed in 43 (95.6%) adolescents. This data corroborates the literature,<sup>5,16</sup> pointing out that type I diabetes mellitus is commonly diagnosed before age 18, as it is most strongly associated with genetic and environmental factors. In turn, type II has influence mainly on the lifestyle of each individual. Therefore, adolescents' attitudes towards inadequate diet and insufficient physical exercise can lead to future health damage, so the diagnosis of type II diabetes mellitus usually occurs after age 40.<sup>5,16</sup>

Adolescents participating in this study presented as main demands of drug care by pointing out that type I diabetes mellitus is commonly diagnosed before 18 years of age, since it is more strongly associated with genetic and environmental factors. In turn, type II has influence mainly on the lifestyle of each individual. Therefore, the attitudes of adolescents related to inadequate diet and insufficient physical exercise can lead to future health damage, so the diagnosis of type II diabetes mellitus usually occurs after 40 years of age (N = 40; 50.0 %) and modified usual care (N = 35; 42.6%), corroborating the most effective treatment option for glycemic control, which is the association of drug treatment with changes in lifestyle. The predominance of medication use can be explained when considering the use of insulin as the first treatment option in most cases of diabetes.<sup>5</sup>

In order for blood glucose levels to be stable and as close to the normal pattern as possible, there must be a balance between exercise and proper nutrition.<sup>5</sup> Of the seven

adolescents (15.5%) in follow-up with professionals other than the specialist physician, nutritional follow-up was the most prevalent (N = 3; 42.9%). A balanced diet with calorie-restricted age and carbohydrate counts reduces liver glucose production and increases your tolerance. Exercise, in turn, decreases the body's fat mass, which increases peripheral insulin sensitivity.<sup>5</sup>

In addition, the study showed low demand from adolescents to health services in general (N = 14, 31.3%), highlighting primary care (N = 4; 23.6%). This data confirms the assumption evidenced in other studies that the link between adolescents and primary health care is still fragile.<sup>17</sup> The resistance of this age group to seek this type of service is linked to the delay in care and referrals, the lack of privacy in care, the failure to receive users and their own lack of knowledge about the services provided by primary care.<sup>18</sup> This was evidenced in the present study, since there were few referrals to other services (N = 15; 33.3%) and none of the adolescents were referred to the primary health care service, which should guarantee continuity and effectiveness of care.

As a result, there is a high demand for urgency and emergency services (N = 8; 47.0%), which may be related to non-adherence to treatment, either due to the difficulty in accepting the diet, exercising or in drug therapy. In the latter, the main causes of non-adherence are delayed or forgotten medication.<sup>17</sup> Non-adherence to treatment generates both acute and chronic complications of the disease, culminating in hospital admissions, for which the gateway in most cases is emergency units.<sup>17</sup> In addition, the follow-up time may also be directly related to non-adherence to treatment, as most adolescents follow-up at the study hospital outpatient clinic for less than five years (N=21; 46,7%).

A study<sup>19</sup> evidenced that non-adherence to diabetes mellitus treatment may be associated with the difficulty of users and their families in understanding the complexity of living with the disease and the long-term health risks it may cause. Thus, the importance of health

professionals in relation to educational actions is highlighted, which should also include family and user and consider the social, economic and cultural context in which they are inserted, in order to provide them with understanding for the importance of health care. proper treatment.<sup>19</sup>

Also, because it is a disease of chronic progression, the adolescent living with diabetes mellitus needs differentiated care, with broad vision and that goes beyond the perceptions of the hegemonic health model. This service is characterized as multiprofessional, and aims to perceive the individual in all its complexity and assist him in coping with the disease.<sup>20</sup> However, findings of this study show that all adolescents are monitored by a specialist doctor (N = 45; 100.0%) and a small minority has the support of other specialties, such as nutritionists, social worker, psychologist and therapist. occupational (N=7; 15,5%).

In addition, it was possible to evidence that the adolescents did not have the professional nurse monitoring. This fact is configured as a harm to the health of adolescents living with diabetes mellitus, since nursing can be an important source of support in the treatment of the disease. Through health education, nursing professionals share their knowledge about the disease, treatment and how to avoid new diseases, enabling the empowerment of users and enabling them to self-care. Thus, nursing care aims to promote health and better quality of life, given that these adolescents will live with diabetes mellitus throughout their lives.<sup>12,19</sup>

Regarding the continuous use of medication, 95.6% (n = 43) of adolescents used at least one medication. It was observed that insulin is inserted in the treatment of most adolescents with diabetes mellitus (N = 39; 90.7%). This is due to the fact that insulin is a safe and effective treatment option for both types of the disease. In type I diabetes mellitus, insulin treatment usually starts from the diagnosis of the disease and when associated with dietary control and physical exercise tends to minimize the problems caused by hyperglycemia.<sup>16</sup> In type II, insulin use is started late, only when there is a greater decline in pancreatic beta cell function. This late-onset insulin option for treatment of type II diabetes mellitus is not supported by all

specialists and may be linked to the fear of side effects in some cases, such as hypoglycaemia and weight gain.<sup>5</sup>

Most adolescents (N = 31; 68.9%) were already admitted to the hospital where this study was conducted. From this data, it is possible to reinforce the idea that the significant quantity of hospitalizations is associated with non-adherence to treatment, which results in the disease becoming more acute, mainly due to uncontrolled hyperglycemia.<sup>5</sup> Moreover, a study<sup>19</sup> points out that the difficulty in living with a chronic disease is even greater during adolescence, since this phase is permeated by physical, emotional, biological and social transformations, and when associated with chronic health condition results in feelings of anguish, sadness, anxiety and denial.

These feelings are mainly related to changes in daily life derived from living with diabetes mellitus, since changes in diet and lifestyle are necessary. This directly influences the social and group life of the adolescent, because at every moment he has to make choices in favor of quality of life in order to keep the disease under control. In this context, it is up to health professionals to support and make adolescents aware of the importance of treatment for a long and healthy life, empowering them through knowledge and making them independent and capable of self-care.<sup>19</sup>

## Conclusions

Adolescents with diabetes mellitus treated at the outpatient clinic of a teaching hospital are predominantly male, from the central region of Rio Grande do Sul, but more than half do not live in the study city. Regarding the clinical profile, there was a predominance of the diagnosis of type I diabetes mellitus, with demands for modified medication and habitual care. The emergency service was the most used. Still, there was little participation of the

multiprofessional team, and the nutritional monitoring was the most prominent. Most adolescents were on continuous medication and were already admitted to the study hospital

It is expected that this study contributes to the training and reflection of health professionals, especially nursing, in order to promote quality care that goes beyond the hegemonic model of health and fully understand the adolescent with diabetes mellitus, valuing the meanings attributed by them and their families in the process of coping with the disease. An innovation for nursing care is the urgent need to turn the eyes on this often invisible clientele in favor of building bonds between adolescents and professionals, aiming at minimizing non-adherence to treatment and health problems.

As limitations, it was identified that this research characterized only the adolescents with diabetes mellitus who attended the outpatient clinic of a teaching hospital in central Rio Grande do Sul, in 2016. Therefore, the sociodemographic and clinical variables found cannot be attributed to all adolescents. Therefore, it is essential to carry out other studies that include other scenarios and other regions of Brazil.

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### **Autor correspondente**

Caren da Silva Bertoldo

E-mail: [carensbertoldo@gmail.com](mailto:carensbertoldo@gmail.com)

Endereço: Rua Floresta nº 212, Apto 405, Bairro Camobi, Santa Maria, RS, Brasil.

CEP: 97110-290

### **Contribuições de Autoria**

#### **1 – Caren da Silva Bertoldo**

Participated in the conception and planning of the research Project, data collection, organization and its interpretation, as well as writing and critical revision of the article.

#### **2 – Júlia Heinz da Silva**

Participated in the conception and planning of the research Project, data collection, organization and its interpretation, as well as writing and critical revision of the article.

#### **3 – Andressa da Silveira**

Participated in the interpretation, writing and critical revision of the article.

#### **4 – Aline Cammarano Ribeiro**

Participated in the interpretation, writing and critical revision of the article.

#### **5 – Jaquiele Jaciara Kegler**

Participated in the organization, interpretation, writing and critical revision of the article.

**6 – Eliane Tatsch Neves**

Participated in the conception and planning of the research Project, data collection, organization and its interpretation, as well as writing and critical revision of the article.

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