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SATISFAÇÃO COM O TRATAMENTO E QUALIDADE DE VIDA EM ADOLESCENTES COM DM1 E SISTEMA DE PERFUSÃO SUBCUTÂNEA CONTINUA DE INSULINA

TREATMENT SATISFACTION AND QUALITY OF LIFE OF ADOLESCENTS WITH T1DM USING CONTINUOUS SUBCUTANEOUS INSULIN INFUSION

SATISFACCIÓN CON EL TRATAMIENTO Y CALIDAD DE VIDA EN ADOLESCENTES CON DMT1 MEDIANTE INFUSIÓN CONTINUA DE INSULINA SUBCUTÁNEA

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RESUMO

Introdução: O sistema de perfusão subcutânea contínua de insulina (PSCI) tem sido priorizado no controlo metabólico de crianças e jovens com Diabetes Mellitus tipo 1 (DM1).
Objetivo: Avaliar a qualidade de vida e a satisfação com o tratamento em adolescentes com DM1 que utilizam o sistema PSCI; Analisar o papel da qualidade de vida na predição da sua satisfação com o tratamento.
Métodos: Participaram 77 adolescentes, entre os 10 e os 18 anos. Utilizaram se dois questionários, um sobre Qualidade de vida associada ao tratamento com PSCI e outro sobre Satisfação com este tipo de tratamento.
Resultados: Os adolescentes tendem, maioritariamente a manifestar uma boa qualidade de vida, com valores mais baixos nas dimensões relativas ao Impacto da Diabetes, Sentimentos e Humor e Tempos Livres. Estão ainda satisfeitos com o sistema PSCI.. Através da regressão linear múltipla, testou-se um modelo de predição, tendo o Impacto da diabetes, os Tempos livres e os Sentimentos e humor explicado 32,7% da variância da Satisfação com o tratamento com PSCI.
Conclusão: O uso da PSCI é uma resposta terapêutica que os adolescentes com DM1 percebem como promotora da sua qualidade de vida e globalmente satisfatória, o que vai ao encontro da evidência. Porém, na promoção da adaptação à doença e regime terapêutico, aspetos como as implicações na autoimagem e a gestão emocional devem ser domínios de especial atenção.

Palavras-chave: diabetes do tipo 1; adolescentes; qualidade de vida; satisfação do paciente

ABSTRACT

Introduction: Continuous subcutaneous insulin infusion (CSII) has been prioritised in the metabolic control of type 1 Diabetes Mellitus (T1DM) in children and adolescents.
Objective: To assess the quality of life and treatment satisfaction in adolescents with T1DM using CSII and analyse the role of quality of life in predicting treatment satisfaction among these adolescents.
Methods: The sample comprised 77 adolescents aged 10 to 18, followed-up in two central hospitals in the Northern region of Portugal. The Quality-of-Life questionnaire for treatment with Insulin Infusion Pump – adolescents' version - and the adapted version for adolescents of treatment satisfaction with Insulin Pump questionnaire were used.
Results: Most adolescents reported a good quality of life, with lower values in the dimensions related to the Impact of Diabetes, Feelings and Mood and Leisure. They were satisfied with the CSII system, recognizing it as convenient, easy to use and guarantying autonomy. A prediction model was tested through multiple linear regression, with the Impact of diabetes, Leisure Time and Feelings and mood explaining 32.7% of the variance of treatment satisfaction.
Conclusion: CSII is a therapeutic option that adolescents with T1DM perceive to promote their quality of life and consider satisfactory, in line with the previous evidence. However, interventions aimed to support these adolescents in managing their disease and treatment should focus on aspects such as self-image and emotional well-being.

Keywords: type 1 diabetes; adolescents; quality of life; patient satisfaction

RESUMEN

Introducción: La infusión continua de insulina subcutánea (IICS) ha sido priorizada en el control metabólico de la Diabetes Mellitus tipo 1 (DM1) en niños y adolescentes.
Objetivo: Evaluar la calidad de vida y la satisfacción con el tratamiento en adolescentes con DM1 utilizando IICS, y analizar el papel de la calidad de vida en la predicción de la satisfacción con el tratamiento en estos adolescentes.
Métodos: Participaram 77 adolescentes, de 10 a 18 años, Se utilizó el cuestionario de Calidad de Vida para el tratamiento con IICS y el cuestionario de satisfacción del tratamiento con IICS.
Resultados: La mayoría de los adolescentes reportaron una buena calidad de vida, con valores más bajos en las dimensiones relacionadas con el Impacto de la Diabetes, sentimientos y Estado de Ánimo y Ocio. Están satisfechos con el sistema IICS. A través de la regresión lineal múltiple, se probó un modelo de predicción, con el Impacto de la diabetes, el Tiempo de Ocio y los Sentimientos y el estado de ánimo explicando el 32,7% de la varianza de la satisfacción con el tratamiento.
Conclusión: La IICS es una opción terapéutica que los adolescentes con DM1 perciben como promotora de su calidad de vida y se sienten como satisfactoria, en línea con la evidencia previa. Sin embargo, las intervenciones dirigidas a apoyar a estos adolescentes para manejar su enfermedad y tratamiento deben centrarse en aspectos como la autoimagen y el bienestar emocional.

Palabras Clave: diabetes do tipo 1; adolescentes; calidad de vida; satisfacción del paciente

INTRODUCTION

Type 1 diabetes mellitus (T1DM) is one of the most common chronic pathologies worldwide, with increasing incidence rates. According to the International Diabetes Federation, approximately 1.1 million children and young people suffer from this disease (Patterson et al., 2019). In Europe, there is also an increasing trend of about 3.4%, and it is estimated to double within 20 years (Patterson et al., 2019). In Portugal, 2015, according to the Observatório Nacional da Diabetes [National Observatory for Diabetes] (Observatório da diabetes 2016), a total of 3,327 individuals aged 0-19 years were diagnosed with type 1 diabetes, corresponding to 0.16% of the Portuguese population in this age group.

In the treatment of T1DM, the aim is to achieve metabolic control at an early stage, avoid complications and premature mortality, and maintain the quality of life of adolescents (Korkmaz et al., 2018). Metabolic control is the priority in the treatment of these young people and requires adherence to a therapeutic regimen that includes diet, physical activity, and medication. The insulin production deficit can be compensated by administering insulin through multiple daily injections (MDI) or continuous subcutaneous insulin infusion systems (CSII). In Portugal, most children and adolescents with T1DM are currently undergoing treatment with CSII. This is the result of a new governmental policy (Lei 13277/2016) that determined the access to this therapeutic modality until 2019 for all the eligible paediatric age population. Health professionals are expected to integrate the perspectives of young people in the development, implementation, and evaluation of their interventions. Thus, studies exploring the adolescents' and their families' experiences with treatment with CSII are vital to developing patient-centred health actions. To the best of our knowledge, few studies have been carried out in Portugal documenting the experiences of adolescents on the use of this type of treatment. Therefore, this study aims to better understand the impact of this treatment recently made accessible to all adolescents by evaluating two patient-reported outcomes (PRO), more specifically, health-related quality of life and treatment satisfaction.

1. THEORETICAL FRAMEWORK

Health-related quality of life is a construct that, when used in diabetes, aims to assess the perception of the impact of the illness on the lifestyle and functioning of an individual (Cruz et al., 2018). By providing the comprehension of the experiences associated with T1DM and its different treatments from the adolescent's perspective, its assessment facilitates clinical decision-making processes and knowledge of the effectiveness of the various therapies.

Treatment satisfaction is another PRO usually used to evaluate patients' experiences with the implementation of new therapies. This construct is defined as the patient's self-assessment of the process attributes and the outcomes of the treatment experience. Also, when referring to medical devices, aspects related to their technical features are often considered, such as device appearance and design, usefulness, and potential discomfort in use (Modzelewski et al., 2019).

The treatment with CSII has been studied compared to treatment using multiple daily injections. Evidence shows its greater effectiveness in reducing the variability of blood glucose levels, particularly in reducing episodes of severe hypoglycaemia. Several other advantages have been identified, including decreasing discomfort with needles and consequently increasing adherence to treatment and promoting the prevention of long-term sequelae (Benioudakis et al., 2021). Advances in the features of insulin pumps were also considered important to adolescents' satisfaction with this treatment. Over the years, these devices have become more efficient, safe, and user-friendly, with lighter configurations and more discreet, thus becoming more attractive to adolescents (Alsaleh et al., 2012; Alsaleh et al., 2014). The psychosocial advantages of suing CSII in adolescence have also been reported through PROs. Quantitative studies have mainly addressed quality of life (QoL) (Rosner and Roman-Urrestarazu 2018; Silva et al., 2017) and treatment satisfaction (Mueller-Godeffroy et al., 2018). These studies have demonstrated that adolescents perceive this treatment as quite satisfactory and promoting their quality of life. There is also qualitative research that enriches the comprehension of the advantages of this type of treatment identified by adolescents, namely increased functionality, and socialization (Alsaleh et al., 2012; Alsaleh et al., 2014).

However, using CSII is also challenging since it requires constant surveillance and adherence to self-care tasks, such as capillary blood glucose monitoring, carbohydrate counting, and changing catheters every three days. Adolescents also mention the difficulty in wearing clothing that conceals the device and its negative impact on self-image (Alsaleh et al., 2012; Alsaleh et al., 2014). Another important challenge stems from the need for greater autonomy in this period of life, which involves becoming gradually more responsible for their treatment. Also, the parents' overprotective behaviour may likely hinder the adolescents' adaptation process. Furthermore, depending on the development of their newly acquired cognitive abilities, adolescents usually become more aware that T1DM is a life-threatening disease and anticipate potential future consequences, which can negatively impact their emotional well-being (Mueller-Godeffroy et al., 2018).

As previously mentioned, in Portugal, there is little evidence about the quality of life of adolescents with Type 1 diabetes mellitus using CSII. Thus, this study aims to assess key dimensions of quality of life and treatment satisfaction of adolescents with T1DM using CSII and analyse the role of quality of life in predicting treatment satisfaction of adolescents with T1DM using this modality of treatment.

2. METHODS

2.1 Sample

A cross-sectional study was conducted with 77 adolescents with T1DM using CSII, followed-up in the outpatient consultation of the

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Paediatric endocrinology department at two central hospitals in the northern region of Portugal. All participants were using the CSII for more than six months prior to the study.

2.2 Data collection instruments and procedures

A sociodemographic (age, gender, education) and a clinical questionnaire (age of diagnosis, last glycated haemoglobin value, frequency of capillary glycaemic testing per day) were applied.

For the evaluation of QoL, the Quality-of-Life Questionnaire for Treatment with Insulin Infusion Pump -adolescents version (QoLTIIP) was used (Sousa 2014). This measure includes ten dimensions: Generic Health and Physical Activity; Feelings and Mood; 'About You'; Family; Friends; School; Leisure time; Money; Future and Impact of Diabetes. Items are assessed on a five-point Likert scale.

The Treatment Satisfaction with Insulin Infusion Pump Questionnaire – adolescents' version (TSIIP) by Sousa (Sousa 2014) was also used. This instrument was adapted from an original version for adults (Apolinário et al., 2010) and includes 40 items that evaluate satisfaction with this modality of treatment, assessed on an ordinal 5-point scale. In addition, a final question was added that asks adolescents how they find the CSII compared to the MDI, with five options: much worse, worse, not worse or better, and better and much better.

The final scores for each dimension of these two questionnaires were recoded to a scale between 0 and 100. The reliability of the instruments was assessed by calculating internal consistency (Table 1). Both measures had acceptable or good reliability scores, except for two dimensions of QoL, namely Generic Health and Leisure Time.

The study was authorized by the ethics committees of the institutions involved according to the Helsinki Declaration [2019.032(028.DEF/029-CE) e CHG31/2019-2]. The adolescents were contacted at the hospital and informed about the study. The adolescents who agreed to participate and whose parents or legal representatives signed an informed consent form, were asked to complete the questionnaire. Privacy, confidentiality, and the protection of personal data were guaranteed.

2.3 Statistical analysis

Data were computed using IBM SPSS version 26.0 for Windows. Pearson's correlation was used to analyse the association between continuous variables and the interpretation of its strength was based on Afonso e Nunes (2019). A T-test for independent samples was used to study means differences between groups. Multiple linear regression was used (Stepwise method) to identify predictors of Treatment Satisfaction.

3. RESULTS

Participants were 77 adolescents, mostly boys (58.4%), aged between 10 and 18 years (M=13.84; SD=2.38). The diagnosis of diabetes occurred on average around the age of 7, and the treatment with the CSII system was typically initiated between the ages of 10 and 13. For 66 participants, it was possible to assess the glycated haemoglobin value for the previous 6 months. The average value of glycated haemoglobin was 7.38 (±7.9), and out of these participants, 57.6% (38) showed reference values equal to or less than 7. Concerning the frequency of capillary glycaemic testing per day, most participants reported that they self-monitored glycaemia around 6, 7 times per day but around more than one-third reported doing it more than 7 times a day, and 10% referred to doing it between 10 to 15 times.

The results showed that most adolescents had a positive perception of their quality of life in all domains. Through the percentiles analysis and considering that the values of each dimension vary between 0 and 100, a positive asymmetric distribution was found in each dimension of the QoLTIIP scale (Table 1).

Table 1 – Descriptives of Quality of life and Treatment Satisfaction.

	Items	Alpha	P25	P50	P75	Mn-Mx	M(SD)
QoLTBII							
Generic H PA	6	.48	76.00	84.00	88.00	52.00-100	88.83(9.78)
Feelings - Mood	11	.84	64.77	75.00	81.82	38.64-95.45	73.20(13.23)
About you	6	.78	62.50	79.17	91.67	29.17-100	75.43(17.24)
Family	3	.78	66.66	83.33	91.66	41.67-100	81.06(16.26)
Friends	5	.86	75.00	85.00	95.00	35.00-100	81.75(15.86)
School	4	.72	68.75	81.25	93.75	43.75-100	79.95(14.80)
Leisure time	2	.57	56.25	75.00	87.50	0-100	71.43(21.06)
Money	1	__	75.00	75.00	100.00	25.00-100	81.17(21.89)
Future	3	.82	58.33	75.00	91.67	25.00-100	74.02(20.05)
DM Impact	18	.86	55.56	66.67	74.31	19.44-94.44	63.99(15.69)
TSIIP	40	.96	48.83	64.54	76.39	44.49-96.33	68.38(14.8)

Legend: Generic H PA – Generic Health and Physical Activity; QoLTBII - Quality of Life questionnaire for treatment with Insulin Infusion Pump – adolescents; TSIIP – Treatment Satisfaction with Insulin Infusion Pump questionnaire; P25 – Percentile 25; P50 – Percentile 50; P75 – Percentile 75;

The Generic Health and Physical Activity dimension scored the highest (M=88.83; SD=9.78), and the scores of the items included in this dimension showed that adolescents reported not feeling sick (M=4.7; SD=0.56) and not considering having limitations in sports practices (M=4.66; SD=0.77) and daily life activities (M=4.51; SD=1.01).
The dimensions of Family, Friends, Money and School also had a mean score equal to or above 80 (Table 1), showing that participants perceived good support both from family and friends, were satisfied with the allowance they had for their personal expenses and were happy about their school life.
The lowest mean score was found in the Impact of Diabetes dimension (M=63.99; SD=15.69), revealing the perceived burden of diabetes on the adolescent's perceived quality of life. In this dimension, participants reported that they were not satisfied with their family's knowledge about T1DM and CSII (M=1.56; SD=0.89), and they feared the worsening of T1DM (M=2.83; SD=1.48). They also reported being afraid of hyperglycaemia (M=3.09; SD=1.38) and hypoglycaemia events (M=3.17; SD=1.39).
Adolescents reported being satisfied with the treatment with CSII, with a total mean score of 68.38 (Table 1). The items with the higher scores revealed the adolescents perception that CSII facilitated the administration of insulin (M=4.23; SD=0.67), the calculation of bolus for meals (M=4.21; SD=0.80), provided autonomy (M=4.23; SD=0.76) and comfort (M=4.13; SD=0.82). The aspects that adolescents evaluated as less satisfactory in the treatment with CSII were those related to the body marks caused by the cannula in the skin (M=2.81; SD=1.91) and the needle in the measurement of capillary blood glucose (M=3.05; SD=0.96), the need to adapt clothing to cover the device (M=3.30; SD=1.18), and the discomfort associated with carrying the pump (M=3.36; M=1.06).
When asked to compare treatment with insulin pump with treatment with multiple injections, most adolescents (94.5%) considered that CSII was better than MDI.
The second objective was to identify the role of quality of life in predicting treatment satisfaction. First, the association between the different dimensions of quality of life and treatment satisfaction was studied using Pearson's r (Table 2). Results showed an association between the different dimensions of quality of life, except for Leisure Time, thus contributing to the evaluation of quality of life of adolescents undergoing treatment with CSII. Also, all dimensions of quality of life were significantly associated with treatment satisfaction total score and with both dimensions concerning the overall treatment and technical features of CSII. The association between age and age of diagnosis, and quality of life and treatment satisfaction were also studied (table 2). Results showed that age was only associated with School, Future and Impact of Diabetes. Weak correlations were found between age of diagnosis and leisure, future and treatment satisfaction. Gender was also studied as a possible influence on quality of life, but no differences were found between girls and boys.

Table 2 – Association between the Quality-of-Life scale and treatment satisfaction with Insulin Infusion Pump, age and age of diagnosis.

	GHPA	FM	About you	Family	Friends	School	LT	Money	Future	DM Impact	TSIIP
QoLTBII											
FM	.575**										
About you	.364**	.657**									
Family	.285*	.533**	.623**								
Friends	.252*	.563**	.467**	.517**							
School	.369**	.559**	.363**	.286*	.528**						
Leisure time	.142	.312**	.308**	.244*	.140	.150					
Money	.393**	.490**	.436**	.325**	.385**	.558**	.191				
Future	.264*	.455**	.375**	.430**	.507**	.430**	.024	.226*			
DM Impact	.531**	.475**	.199	.021	.156	.444**	.086	.462**	.176		
TSIIP	.264*	.488**	.371**	.318**	.354**	.328**	.353**	.451**	.243*	.430**	
Age	.042	-.014	-.133	-.143	.192	.316**	-.198	.183	.231*	.337**	.128
Age Dig	-.051	.035	.160	.000	.068	.091	.229*	.271*	.106	.117	.260*

Legend: GH PA – Generic Health and Physical Activity; FM - Feelings Mood; A you – About you; LT- Leisure time; QoLTBII - Quality of Life questionnaire for treatment with Insulin Infusion Pump – adolescents; TSIIP – Treatment Satisfaction with Insulin Infusion Pump questionnaire; Age Dig – age of diagnosis.

The results from a multiple regression using a stepwise method are summarized in Table 3. Except for Money, all dimensions of QoL were entered in the model as predictors of treatment satisfaction (total score). The model was found statistically significant (F(3.73)=11.850; p=0.000), with only three dimensions contributing to explaining 32.7% (adjusted R2 value) of treatment satisfaction. Those dimensions were Feelings and Mood (B=0.299; *t*=2.610; *p*=0.11), Leisure Time (B=0.239; *t*=2.359; *p*=0.21) and Impact of Diabetes (B=0.241; *t*=2.200; *p*=0.31). The variable that explained most of the variance of treatment satisfaction was Feelings and Mood (23.8%) and Leisure Time and Impact of Diabetes explained 4.5% each.

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Table 3 – Results of linear regression analysis.

	Unstand. Coef.		Standardized Coef.		
Model	**B**	**Std. error**	**Beta**	***t***	***p***
(Constant)	39.286	17.303		2.270	.026
Diabetes Impact	.663	.254	.299	2.610	.011
Feelings and Mood	.333	.141	.239	2.359	.021
Leisure time	.449	.204	.241	2.200	.031

Notes: Dependent variable: Satisfaction with DM treatment

4. DISCUSSION

These study results suggest that the use of CSII is a therapeutic modality perceived by adolescents with T1DM as globally satisfactory and promoting their quality of life, which is in line with existing evidence (Hussain et al., 2017; Rosner and Roman-Urrestarazu, 2018). This study also suggests that the use of CSII is a therapeutic response that enables good metabolic control since most participants showed an HbA1c value within the therapeutic target (DGS, 2019). As previously mentioned, its effectiveness has been demonstrated through several empirical studies (Benioudakis et al., 2021; Driscoll et al., 2016), systematic reviews, meta-analysis (Cherubini et al., 2014), multicentric studies (Lukács et al., 2018), and longitudinal studies (Observatório da diabetes, 2016). Notably, most studies previously developed on the QoL of adolescents using CSII were comparative studies, in which adolescents compared the CSII with the multiple injection system, a type of treatment that participants in this study also experienced before starting treatment with the insulin pump. Literature shows that, compared to MDI, the use of CSII is associated with a higher quality of life, both globally (Shaikh et al., 2020) and in its various dimensions (Rosner & Roman-Urrestarazu, 2018; Silva et al., 2017).

In this study, quality of life was evaluated in different domains or functioning areas, however, the association found between all these dimensions demonstrates that they all contribute to the assessment of the overall quality of life. The Generic Health and Physical Activity was the dimension with the highest score, revealing that adolescents had a very positive perception of their physical functionality and perceived themselves as healthy people, as found in a study by Silva and al. (2017). Globally, studies on quality of life of adolescents with T1DM in different types of treatment produced outcomes that pointed to a very positive perception of health, being the groups with CSII reporting the best results concerning this indicator (Hussain et al., 2017). Health perception has been increasingly emphasized in research as an important outcome variable, and some evidence has further proven that this indicator is more significantly associated with HbA1c than with the type of therapeutic regimen (Keller et al., 2017).

Participants also reported being satisfied with the Support from family and friends. These two dimensions reflect aspects more often denominated as perceived social support, and again, these findings are in line with those of other studies that highlight the importance of family (Alvarenga et al., 2022) and friends (Özyazıcıoğlu et al., 2017) to the adolescent's quality of life.

Concerning quality of life in the school dimension, the average score obtained was also high. In a systematic review involving qualitative studies, adolescents referred to more flexible management of their lifestyles concerning social activities and school life as one of the advantages of CSII treatment (Alsaleh et al., 2012). More specifically, this study emphasized that adolescents viewed the use of the insulin pump as an advantage since it prevented them from leaving the classroom to find a space that could offer some privacy for the administration of insulin. As such, treatment with CSII, besides not interfering with the learning activities, also prevents the potential drawing of unwanted attention likely to cause discomfort and embarrassment (Alsaleh et al., 2012).

The scores for the dimensions relating to Feelings, Mood and Leisure Time were relatively lower. The results for Feelings and Mood are probably explained by the emotional burden of living with T1DM. The cognitive development during adolescence enables to better understand the chronicity of T1DM and consequently fear potential long-term consequences that can negatively impact the health and well-being of these adolescents (Mueller-Godeffroy et al., 2018).

Of all the QoL dimensions, the Impact of Diabetes scored the lowest. The items assess specific aspects of the adaptation to T1DM and management of the therapeutic regimen, which are usually present in specific instruments for the evaluation of quality of life associated with T1DM. This result suggests that although treatment can help normalise the functionality of these adolescents, the perception of some burden and the difficulties inherent to experiencing a chronic disease continue to linger and affect the adolescents' well-being. In this dimension, the fear of decompensation due to the occurrence of hyperglycaemia and hypoglycaemia was reported as one of the most negative aspects in the management of the disease. This type of fear, which is frequent due to the rather stressful and serious nature of this event, is also commonly described in the literature for all treatment modalities (Driscoll et al., 2016). The present study also produced another result that reinforces the importance of considering this fear when providing support to these adolescents, that is, a considerable number of adolescents continue to self-monitor glycaemia more often than necessary, and only two-thirds have an average frequency of capillary glycaemic testing of 5 or 6 times a day, as recommended by recent guidelines (DGS, 2019).

Adolescents were globally satisfied with the CSII system. When asked about their satisfaction with the CSII system, almost all participants stated that they preferred this therapeutic option over the MDI system, also corroborating the results from previous research (Brew-Sam et al., 2021; Hussain et al., 2017; Mueller-Godeffroy et al., 2018; Silva et al., 2017). They also reported that they were particularly satisfied with the increased comfort and flexibility concerning their lifestyles and preserved autonomy.

These aspects were also observed in some studies, demonstrating that these are important aspects in the satisfaction with this type of treatment (Alsaleh et al., 2012). Regarding aspects that were evaluated as less satisfactory about the use of CSII, issues associated with the implications on the adolescent's self-image were highlighted, namely the skin marks caused by the catheters and the need to adapt clothes to cover the device. Again, the interpretation of these results is at least partly explained by the developmental tasks of adolescence since there is a need to develop a personal identity, but also great dependence on peer approval, which makes it difficult to accept oneself as different (Mueller-Godeffroy et al., 2018).

Another aim of this study was to identify the role of the different dimensions of quality of life as predictors of satisfaction with CSII treatment. The analysis of the results of the association between these variables, showed that there was a positive association between quality of life and satisfaction with CSII treatment, as found previously (Haas et al., 2020). Three variables were also found as significant predictors explaining more than one-third of the variance of treatment satisfaction, namely Feelings and Mood, Impact of Diabetes and Leisure Time. Interestingly, these were the dimensions with the lowest scores, pointing to the need to focus on the emotional needs of adolescents when developing interventions aimed to promote adjustment to diabetes and satisfaction with treatment with CSII. Another important focus of attention emerging from the results concerns the integration of CSII with leisure activities, since this area was also found to be a determinant of satisfaction with this treatment. As discussed earlier, developmental tasks of adolescence require building up an identity and the acquisition of more autonomy but also greater opportunities for socialization with peers. All these tasks can be compromised by the presence of T1DM, especially if treatment is not perceived as satisfactory and secure.

CONCLUSION

A recent governmental policy has provided adolescents in Portugal with access to treatment of T1DM with CSII. The evidence on the impact of this treatment is still relatively scarce, so the present study aimed to study quality of life and treatment satisfaction of adolescents with T1DM using CSII and to analyse the role of quality of life in predicting treatment satisfaction in adolescents with T1DM using this modality of treatment.

Most participants perceived good global quality of life, however, they expressed a lower perception in areas related to diabetes management, emotional well-being, and leisure, which in turn, were found to explain one-third of the variance of treatment satisfaction in the predictive analysis.

Overall, adolescents were satisfied with the CSII system and considered it convenient, easy to use, and promotes their autonomy.

Despite the limitations of this study, because of its cross-sectional design and relatively small sample size, this research is likely to contribute to the development of interventions aimed at facilitating the adolescent's adjustment to treatment with the insulin pump. Adolescents and families should be assisted in developing strategies for emotional management and coping with the implications of treatment in areas like self-image and how to handle the technical aspects of CSII appropriately. The assessment of PROs like quality of life and treatment satisfaction can also help health professionals provide individualized care to adolescents with T1DM undergoing treatment with insulin pump.

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