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RESILIENCE IN ADOLESCENTS WITH TYPE 1 DIABETES¹

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ABSTRACT. This study investigated resilience processes in adolescents with type 1 diabetes, identifying risk and protective factors through multiple case studies. The participants were three adolescents (two boys and one girl), aged 13 to 14 years old, who were patients at an institution specialized in treatment of diabetic patients, and their mothers. The instruments used consisted of semi-structured interviews and the Five Field Map. The interviews were designed to investigate how these patients take care of their own health, how they cope with the disease, the benefits and losses of having diabetes, as well as personality characteristics and future plans. Qualitative content analysis was carried out using WebQDA software, based on the Bioecological Theory of Human Development. It was found that protective factors such as social support, emotional attachment and personal characteristics of self-esteem, optimism and altruism contributed to the expression of resilience processes. Conclusions highlight the importance of strengthening the support network as a protective factor for coping with type 1 diabetes, especially through the integration between the different contexts in which teenagers are inserted.

Keywords: Diabetes; resilience; adolescence.

PROCESSOS DE RESILIÊNCIA EM ADOLESCENTES COM DIABETES MELITUS TIPO I

RESUMO. Este estudo investigou processos de resiliência em adolescentes com diabetes melito tipo 1 (DM1), identificando fatores de risco e proteção por meio de estudos de caso múltiplos. Participaram três adolescentes, uma menina e dois meninos, entre 13 e 14 anos, pacientes de um serviço especializado em *diabetes*, e suas mães. Os instrumentos utilizados foram entrevistas semiestruturadas e o mapa dos cinco campos. As entrevistas tinham por objetivo investigar os cuidados com a saúde, o enfrentamento da doença, benefícios e prejuízos da mesma, além das características individuais e os planos de futuro dos adolescentes. A análise qualitativa de conteúdo se deu com auxílio do software *WebQDA*, e com base na Teoria Bioecológica do Desenvolvimento Humano. Constatou-se que fatores de proteção como apoio social, vinculação afetiva e características pessoais de autoestima, otimismo e altruísmo, contribuíram para a manifestação de processos de resiliência. Destaca-se a importância de fortalecer a rede de apoio como fator de proteção para o enfrentamento do DM1, principalmente por meio da integração entre os diferentes contextos nos quais o adolescente está inserido.

Palavras-chave: *diabetes mellitus*; resiliência; adolescência.

PROCESOS DE RESILIENCIA EN ADOLESCENTES CON DIABETES MELLITUS TIPO 1

RESUMEN. Este estudio investigó procesos de resiliencia en adolescentes con diabetes mellitus tipo 1 (DM1), identificando factores de riesgo y protección, a través de estudios de caso múltiples. Fueron participantes tres adolescentes, una del sexo femenino y dos del sexo masculino, entre 13 y 14 años, pacientes de un centro especializado en diabetes, y sus madres. Los instrumentos utilizados fueron entrevistas semiestructuradas y el Mapa de los Cinco Campos. Las entrevistas fueron diseñadas para investigar los cuidados con la salud, el enfrentamiento de la

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enfermedad, los beneficios y las pérdidas de tener diabetes, y también las características individuales y los planes de futuro de los adolescentes. El análisis cualitativo de contenido se realizó con auxilio del software WebQDA, y con base en la Teoría Ecológica del Desarrollo Humano. Los resultados demuestran que factores de protección como el soporte social, la vinculación afectiva y las características personales de autoestima, optimismo y altruismo, contribuyeron para la manifestación de procesos de resiliencia. Las conclusiones señalan la importancia del fortalecimiento de la red de apoyo como un factor de protección para el enfrentamiento de la DM1, especialmente a través de la integración de los distintos contextos por los cuales el adolescente está insertado.

Palabras clave: Diabetes mellitus; resiliencia; adolescencia.

Type 1 diabetes mellitus (T1DM) is an autoimmune chronic disease characterized by complete insulin deficiency due to the destruction of beta cells in the pancreas. Managing T1DM involves several challenges: daily insulin applications, constant monitoring of glucose levels in the blood, permanent follow-up with health professionals, diet restrictions, regular practice of physical exercise, and others (Guttman-Bauman, Flaherty, Strugger, & McEvoy, 1998). Because of the demands of the disease, many studies have investigated the consequences and impacts of T1DM in adolescence.

The authors highlight the interferences of the abrupt onset of the disease and the care it requires for the adolescent's well-being, quality of life and self-image (Guttman-Bauman et al., 1998). Many are the studies that show how transitions typical of adolescence interact with the demands of a life with a chronic condition (Tuchman, Slap, & Britto, 2008; Williams Gannon, & Soon, 2011).

Resilience refers exactly to the class of phenomena characterized by good results in adverse contexts, as that of diabetes, and in face of threats to development and adaptation. It is a common phenomenon resulting from adaptive systems of the human being, which manifests before real threats to development and is marked by the interaction between risk and protective factors (Masten, 2001).

Resilience is currently understood as an individual coping ability, but also as a condition for families, communities and different cultures to provide individuals with healthy resources and experiences (Ungar, 2008). Researches on resilience are interested in comprehending how processes that end up in good results in face of adverse situations develop, and, for such a purpose, it is important to investigate the risk and protective factors that act in the studied context.

Castro and Moreno-Jiménez (2007) stress the importance of resilience studies aimed at chronic patients, for the new perspective that this concept offers: to emphasize positive development, possibilities of adaptation and overcome before the disease. However, researches and intervention plans with chronic patients and with a focus on resilience are scarce and remain as a big challenge for researches in the area. Working with this concept means to focus on potentialities and innumerable situations of daily overcome in the fight for survival, instead of emphasizing the risk situation to which these adolescents are subjected (Vasconcelos, Yunes, & Garcia, 2009).

The Bioecological Theory of Human Development, for proving adequate to the comprehension of human phenomena in their context, has been widely used to found studies about resilience. Human development, according to Bronfenbrenner (2005), occurs through external, immediate and increasingly complex interactions of the human being with people, objects and symbols. These interactions are called proximal processes and occupy a central position in the most recent phase of the Bioecological Model of Human Development. Bronfenbrenner (2005) proposes that development takes place in the interaction between four elements: process, person, context and time (PPCT).

Proximal processes can have competence or dysfunction effects (Bronfenbrenner & Morris, 1998). The characteristics of the person and of the environment in which he or she is developing unite to define the form, the content, the strength and the direction of proximal processes (Bronfenbrenner, 2005). The context is constituted in the interaction between four instances: microsystem (face-to-face interpersonal relations); mesosystem (set of microsystems and their interactions); exosystem (environments in which the individual is not an active participant), and macrosystem (set of ideologies, values and beliefs). The time involves the chronology of a person's development and the historical process to which he or she is subjected.

The procedural reading of human development proposed by Bronfenbrenner through the PPCT model enables, among other things, the comprehension of health as a process rather than as a static condition (Morais & Koller, 2005). In this way, this study aimed at investigating resilience processes in

adolescents with T1DM, identifying risk and protective factors and coping strategies before the adversities experienced.

Method

Participants

This study counted with the participation of three adolescents assisted by a diabetes specialized service, aged between 13 and 14 years old, being one female and two males, attending between the fifth and the eighth grade of Elementary School. They were appointed by the health team based on criteria related to age group (between 12 and 17 years old) and subjection to T1DM treatment for more than six months at least. Besides these criteria, the adolescents could not present any difficulty that prevented them from comprehending the instruments. Their mothers were interviewed as well for additional information.

Design

This is a qualitative and cross-sectional research, with a multiple case study design (Yin, 2010). Study cases allow for the investigation of contemporary phenomena within a real context. More than one source of evidence was used, seeking for data triangulation (Yin 2010).

Instruments

Semi-structured interviews: With a script based on Oliveira and Gomes (1998), the interviews sought to collect from the adolescents data on healthcare, coping with the disease, benefits and harms of the latter, in addition to individual characteristics and plans for the future. The interview with the mothers searched for data on the adolescent' story, their perception on their children and the type of support provided.

Medical records: Were used to collect sociodemographic data and information about the disease story and glycemic control over time.

Five Field Map: Ludic instrument adapted for Brazil by Hoppe (1998), through which the adolescents arranged figures to represent their support network divided into family members, friends, formal contacts, school and relatives.

Procedures

This research complied with the determinations of Resolution 196/96 of the Ministry of Health and obtained the mothers and the adolescents' free consent, and approval by the Ethics and Research Committee. One of the participants was appointed by the health team for presenting a satisfactory glycemic control, whereas the other two used to attend the hospital at the institution, presenting cases in which the disease was hard to control. The cases were chosen by convenience, seeking to contrast different profiles in the coping with T1DM.

The meetings took place in a private room, along two sessions, with a break for lunch, or on different days. The adolescents answered the instruments within a maximum of two hours and a half, and the interviews with the mothers varied between 45 minutes and an hour.

Data Analysis

The interviews were recorded and transcribed for analysis, and the Five Field Map was analyzed according to Siqueira, Betts, and Dell'Aglio (2006). The qualitative analysis of the content of the interviews was carried out with the aid of the WebQDA, a software program for qualitative data analysis

in distributed collaborative environment (Souza, Costa, & Moreira, 2011). Data was organized from four analysis axes for each case, based on the model proposed by Bronfenbrenner and Morris (1998) – process, person, context and time –, and was entitled “personal characteristics, proximal processes and support, diabetes in different contexts, and diabetes throughout time”. The cases will be presented from the analysis axes described, with fictitious names.

Results

Case 1: Camila is 13 years old, the youngest child of a family of four siblings, and lives with her parents in Porto Alegre's metropolitan area. She received the diabetes diagnosis at the age of five, having been hospitalized for six days, two of which at the Intensive Care Unit. In spite of the shock of the news and the care that Camila began to demand, her mother says they adjusted well to the changes in their routine. Camila attends regularly the consultations at the health service that has been following her up since November 2004. She participates in a race group that meets every week under the supervision of a physical educator. She attends the eighth grade at a municipal school and defines herself as an average student. Overall, the adolescent presents satisfactory glycated hemoglobin (A1C) levels, a set of substances used as a diagnostic tool (Netto et al., 2009). Until turning twelve years old, Camila remained within the reference values between 7.5% and 8.5%. As of thirteen, the reference value was 7.5%, but the adolescent began to present levels around 9%.

Concerning personal characteristics, Camila proved to be a talkative and extraverted adolescent, qualities also pointed by her mother. The latter appears as a central figure in the diabetes coping, at the same time that the relationship between them is conflicting. One of her sisters occupies an outstanding place as a source of support as well. The relationship Camila has with her father is, according to herself, distant. In general, the reports reveal an overprotective family; excessive care was pointed in the interviews and often becomes a source of tension. The interaction with peers is basically restricted to the time she spends at school and to the race group. Through this group, Camila has also conquered a reference figure linked to the health team, the physical educator, unlike other members of the team that, for their strict attitude about the treatment, are not esteemed by the adolescent.

The contexts through which Camila moves are quite restrict, being generally limited to her home, health service and leisure environments (mall, beach, parks and some parties). The adolescent presented the school as a safe and pleasant environment. Her mother, however, reports an episode of disagreement with the school's principal and teachers, due to their lack of preparation to deal with Camila's special needs. The concern that the adolescent might need to be assisted is the main argument for her activities away from home to be restricted and supervised by her family.

With respect to time, it is noticeable that the past is linked to the surprise of the diagnosis news, to the hospitalization period, to the initial fear, to unawareness, and to the adaptation to a new healthcare routine. Now, on one hand, the adolescent shows independence in blood sugar monitoring and insulin application tasks, and, on the other, there is an “outrage” phase through which the mother says the girl is going. In the future, Camila wants to be a physical education teacher to be able to help other patients with diabetes in the same way that she has been receiving it.

Case 2: Pedro is 14 years old, the youngest child among five siblings, three of which from his father's other marriage, and one of same father and mother. Pedro lives with his parents, attends the sixth grade of Elementary School and works on the opposite shift as a receptionist and delivery boy at a watch shop. The T1DM diagnosis came at the age of six, after an episode in which he was found unconscious in his room. Taken to the hospital, Pedro stayed at the ICU, in coma, for two weeks. Right after discharge, Pedro and his family adapted to the new routine, and the glycemic control was satisfactorily performed. Between the ages of six and 10, his glycated hemoglobin levels stood within the reference values. From then on, they went up abruptly, reaching worrisome levels between 14.7% and 13%. In the last year, he suffered two hospitalizations due to diabetic ketoacidosis, consequences of lack of insulin, of errors in carbohydrate counting, and of diet abuse. The mother reports that her son is going through a tough phase and considers that he is not aware of the severity of the disease. His

father does not participate actively in the care for the boy; he has a very limiting chronic disease. Pedro has failed twice in school, according to his mother, because of the periods of unstable blood sugar control.

Regarding the adolescent's personal characteristics, his mother says that he is an intelligent boy who learns easily, especially when it comes to machines, engines and computers. She also reports that her son is in a rebel phase and that he thinks everything he does is right. At the same time, she describes Pedro as protective of others, concerned about his appearance and health. The adolescent, in turn, highlights the fact that he does not like to have diabetes, because he often feels limited by the disease.

In terms of proximal processes, in the Five Field Map, the mother was represented as a reference person in the care for his health. His siblings on his father's side were not mentioned, whereas his sister was represented as a source of support. Even though his father does not participate actively in the family routine, the adolescent claims to be very close to him. He also has many friends at school and in his neighborhood who come over his house to play football and videogames. Electronic games were pointed as an important resource to relieve tensions caused by the disease.

Pedro's routine comprehends three main contexts: home, school and work. The reports show that at school the lack of control over diabetes has become an important obstacle, hindering his concentration and assiduity. The school is in a constant dialogue with the family, has been informed about the special needs of the adolescent, but fails in some aspects, such as to providing him with a meal that suits his diet restrictions.

Concerning time passing, first there are the negative memories of the period of the diagnosis. The awakening from coma was a reason for extreme joy, at the same time it brought with it the adaptation to a new routine. Now, Pedro is emphatic when stating how much the disease interferes with his daily tasks. The recent discovery that his cholesterol levels would be altered as well is another difficulty to overcome. His mother classifies the current phase as the hardest one since the diagnosis. The adolescent verbalizes few plans for the future and knows that he wants to get a good job when she finishes High School. His mother, in turn, has as main concern for her son's future the denial of the disease. According to her, Pedro is fully convinced that the cure for diabetes will be discovered in the near future.

Case 3: Daniel is 13 years old, the youngest child among three siblings, and lives with his mother, stepfather, a 19-year-old sister and his nephew. The adolescent has lost contact with his father, who has two other children, since a long ago. Daniel received the diagnosis when he was only two years old and, both the adolescent and his mother merely refers to that period. For some years, the adolescent was taken care of by his older sister. His mother does not comment the reasons why she left home, only says that she always counted on the help of relatives when it was needed. Currently, the attendance to consultations and exams is low, around two visits a year to the service; in 2004, there was none. Blood sugar has always been above the reference value, presenting a big increase in the last few years, reaching values three times above the acceptable level. The medical records of the last visits to the service indicate the occurrence of diet abuse and decompensation. His mother complains that, from the age of ten, the boy has become sloppier and, although she has been trying to hold him accountable for controlling the disease, he keeps soliciting her all the time. Daniel is in the fifth grade, has failed once and started school with a one-year delay. On the opposite shift, he practices capoeira, an activity he enjoys and through which he makes many friends.

Daniel had trouble talking about himself. Among his qualities, he highlighted he is good at sports and capoeira, although diabetes often hinders his performance, because he feels tired. He describes himself as a "*Paraguayan low battery...*". His mother says that her son is "*lazy, a freeloader and sloppy*". According to her, Daniel "*let go of himself*" especially from the age of 10, presenting a temper she describes as "*annoying and grumpy*".

Daniel's closest relationships are with her mother and sister. Both take turns to take care of him. The adolescent says that he currently counts on his mother to help him in coping with diabetes, but explains that his sister was the one who raised him. His father is not mentioned at any point by Daniel and was represented in the Map as a distant figure. The mother says that her son has greatly suffered

for the absence of his father. On the other hand, he counts on the support of many relatives living nearby, in addition to friendship bonds established at school and in the capoeira group. Daniel also points the health team as a partner in the coping with diabetes, stating that the only bright side of having the disease is to participate in the activities and tours organized by the service.

The routine of this adolescent essentially involves three contexts: school, home and the capoeira group. Although he does not like to study, the adolescent describes the school as a pleasant environment. His mother feels very supported by the professionals working there, saying that they are prepared to meet her son's needs. Daniel and his mother report many disagreements at home. She would like him to help more with the chores. He feels very pressured, and when he is home he prefers to distract himself by listening to music. When the arguments become very frequent, Daniel goes to a LAN gaming center, where he talks with his friends on social networks.

When it comes to time, the diagnosis came to the family as "a bucket of cold water" in the past. To the adolescent, however, it is as if the disease had always been part of his life, since it was found out when he was two. Still about the past, his mother is sorry for having "ruined" her son. She says she started to spoil him more after the diagnosis and, for this reason, she believes that is why she has troubles with him now. Daniel states that diabetes is "*the worst thing a person can have*" and attributes to the "*needle pricks*" the hardest part of the treatment. In the future, he would like to serve the army, but knows that he will not be accepted for being diabetic. Among future dreams, he also wants a cure for diabetes to be discovered.

Discussion

The axes derived from the data content analysis are displayed in Tables 1 and 2 and discussed afterwards.

Table 1 – Risk Factors in the Cases Investigated

	Camila	Pedro	Daniel
Person	Contestation Impatience Impulsiveness	Contestation Physical limitation Denial High cholesterol	Contestation Physical limitation Apathy
Process	Conflicts with her mother Barely present father Overprotection Few friends	Distance from his father Work School failures	Bond breaks School failures
Context	Social prejudice Unprepared school	Unprepared school	Few visits to the service Delayed admission to school
Time	Current "outrage" phase	Negative perspective in the present High glucose levels Hospitalization episodes	Absent mother High blood sugar levels View on the present and future

Table 2 – Protection Factors in the Cases Investigated

	Camila	Pedro	Daniel
Person	Acceptance Social skills Connection	Intelligence Affectivity Social skills	Social skills Affectivity
Process	Support network Friendship with peers with T1DM Exercise practice	Support network Work Distraction coping	Support network Exercise practice Distraction coping
Context	Race group	Capoeira group	Care from the school
Time	Good blood sugar levels View on present and future Altruist attitude	Stable blood sugar levels in childhood	Positive memory of childhood

Personal Characteristics

The data analysis allowed identifying personal generator characteristics, which work as protective factors, and disorganizer ones, which, as obstacles to the formation of proximal processes, can characterize risk factors (Bronfenbrenner & Morris, 1998). To Camila, the disorganizer characteristics are linked to a difficulty in controlling impulses and emotions, whereas in Daniel and Pedro apathy and denial, especially concerning the disease, are the characteristics that seem to work as obstacles to the occurrence of proximal processes. As protective factors, it is possible to observe Camila's engagement in activities and care actions necessary for the treatment of the disease, as well as social skills that favor the formation of affective bonds that are also observed in Pedro and Daniel's cases.

Affectivity was a personal generator characteristic that stood out in the three of the cases and that constituted an important protective factor, since stable affective relations throughout time strengthen the ability to overcome adversities (Diniz & Koller, 2010), providing stability and security in the coping with diseases as T1DM.

As opposed to the affectivity characteristics and social skills, it was possible to observe attitudes marked by contestation and complaint pointed especially by the mothers as obstacles to the adequate treatment of the disease. At this stage of adolescence, important relational transformations occur, mainly between parents and children, and rebellion and contestation characteristics reflect a renegotiation of roles in an attempt to conquer autonomy, an important developmental task of adolescence (Preto, 1995). Developmental tasks in this period may become particularly hard when they have to be conquered at the same time the adolescent lives with a chronic disease. Because of the demand for a specific care, the structural changes of adolescence can work as a risk factor for glycemic control and management of the disease, as pointed in studies with this population (Palmer et al, 2004).

Personal experiences and knowledge acquired with time, considered by Bronfenbrenner (2005) as the person's characteristics as well, will influence the way that the disease will be faced in the adolescence context. In this sense, it is interesting to observe differences present in Camila's discourse in comparison with the discourse of the two boys. Whereas she gradually learned to live with the disease, acquiring the resources and skills necessary for an adequate management of T1DM, they have trouble complying with the treatment. Camila's discourse reveals acceptance of the disease, with fewer complaints about the impact of the symptoms and of the care actions in her daily routine. Whereas Pedro says he does not like to have diabetes and Daniel refers to the disease as "*the worst thing a person can have*", Camila can even present advantages of living with T1DM.

Proximal processes and support

The relations with the adolescents with people, objects and symbols also reveal important elements about coping strategies in face of the disease. The social support network is a fundamental protective factor for coping with a chronic disease (Pisula & Czapinska, 2011). The proximal processes observed refer to the forms of social relationship and to the formation of bonds among the participants. In the three cases, the main bond of the adolescents is established with their mothers, references in the coping process. Studies with diabetic adolescents of different nationalities point at the importance of the maternal figure as a source of support in the treatment of chronic diseases (Heleno et al., 2009; Oliveira & Gomes, 1998).

According to Cyrulnik (2005), the possibilities of manifestation or absence of resilience processes reside in the conditions of the environment in which the adolescent is inserted. If within the family context some of the figures fail to provide support, others can take on this role, guaranteeing development resumption. This dynamics could be observed especially in Daniel's case, in which the sister took on the role of a mother for some years, in addition to relatives.

The absence of the father in the adolescents' routine was highlighted in the three cases: more subtly by Camila, whose father works several hours per day; more intensely by Pedro's mother, with a convalescent husband; as for Daniel's father, there is no longer any type of contact. According to Bronfenbrenner (2005), the interactions of the triangle formed between the father, the mother and the child, when mediated by encouragement, participation, admiration and affection, speed up development. The absence of the "third responsible party" increases the risk for problems in the development that in adolescence can lead to school dropout, involvement with gangs, lack of interest in working, violence, criminal acts, among other issues (Bronfenbrenner, 2005).

No serious development problems that reveal an important impact of the fathers' failure as third responsible parties were identified in the behavior of the young participants of this study. It is possible that Daniel and Pedro, whose fathers were less present, have found in other people of their network the support a third responsible party needs to provide. The chance to count with substitute sources of support can contribute to a health development for both the environment and the adolescent himself or herself. The assistance provided to single parents by close relatives, friends, neighbors or support group professionals also characterize an "immunization" factor against the occurrence of development problems (Bronfenbrenner, 2005).

Proximal processes established with the health team members were greatly evidenced in the three cases, especially in the mothers' reports. When a family has a member with a chronic disease, the former will also have a "chronic" relationship with the health professionals, who will then be part of their lives forever (Burd, 2007). Gratefulness expressions from the mothers in relation to the support from the health team were frequent, because it went beyond the attention to physical aspects to follow up the families with psychological and social support. The adolescents reveal this extensive care provided by the team when they mention the tours the service organizes, the participation in the race group, and the interaction with peers with the same diagnosis.

With respect to the support from the team, Camila's case stands out, as she presents a meaningful bond with a specific professional. This connection seems to favor the compliance with the treatment by facilitating the assiduity of the visits to the service, preventing the adolescent from seeking for assistance only in moments of crisis (Tuchman, et al., 2008). Camila participates regularly in race activities, highlighting in her discourses the positive effects of the interaction with friends who have T1DM. Interaction with peers with the same diagnosis can characterize an important protective factor, promoting mutual support and identification with the group (Williams et al., 2011).

Regular exercise practice was another element of proximal processes with competence effects mentioned by the adolescents. Camila and Daniel play sports regularly, she runs and he plays capoeira. Increased sensation of well-being, weight control, improved physical condition, cardiovascular capacity and metabolic control are some of the benefits of regular and supervised practice of physical exercise in patients with T1DM (Wasserman & Zimmerman, 1994).

Interaction with technology appeared in Pedro and Daniel's reports when they referred to elements that facilitated the coping with diabetes. In Pedro's case, electronic games are a means of distraction before the limitations provoked by the disease; as for Daniel, social networks facilitate the communication with peers, and music helps when he wants to relax. The interactions of the adolescents with the computer, videogames and music are examples of proximal processes that characterize a protective factor for coping with T1DM, acting as distraction coping strategies. Mentioned by Kyngas (2004) as unusual sources of support for adolescents with chronic diseases, interaction with technology characterizes a proximal process for involving activities that become progressively more complex, stimulating the adolescent's attention, exploration, manipulation and imagination (Bronfenbrenner & Morris, 1998).

To Kliewer (1991), strategies focused on emotion, such as avoidance and distraction, can work as adaptive ones when the child has no control over the problem situation or when it produces a lot of emotion. Distracting oneself by using technology can be an attempt to control the situation, postponing the need to deal with the stressor. A study with diabetic adolescents found that the use of strategies such as acceptance and distraction is associated with improvements in the quality of life and in metabolic control (Jaser & White, 2011).

Diabetes in different contexts

The analyses revealed contexts that promoted and did not promote resilience in the four systems: micro, meso, exo and macro. In the microsystem, the contexts that offer healthy experiences are: the assistance service, in Camila's case, and the capoeira group, in Daniel's case, spaces where they feel supported or that provide the chance for them to feel equal to their peers. On the other side stand the microsystems that fail to promote healthy resources and experiences, as Camila and Pedro's schools. The reports reveal the lack of preparation of these environments to deal with the needs of the adolescents. Holland and Collet (2011) also observed the school's lack of structure to provide support to its students with chronic diseases, lack of information about the disease, of preparation of teachers and of communication with the family and the hospital. In the exosystem, the professional activity of the parents of the three adolescents stood out. The working routine of Daniel and Pedro's mothers and of Camila's father in some moments raised difficulties to the presence of these reference figures in their daily care. Daniel's first symptoms, for instance, were identified by his sister, since his mother had a heavy working load at that time. Pedro's mother feels guilty for not being more present in the care routine of her son. Camila's father, in turn, hardly interacts with his daughter, having little involvement in the care actions regarding the disease.

The macrosystem reveals the interference of values and beliefs with the way that each patient and mother perceives diabetes. The coping strategies that each adolescent reveals have a strict relationship with beliefs and values that surround the contexts in which they are inserted (Xavier, Bittar, & Ataíde, 2009). From the moment they start treatment, the adolescents and their support network gradually add values and beliefs to the knowledge of the medical team, positive and negative experiences of daily living, values of other patients with the same diagnosis, etc., constructing a new meaning to what they are experiencing. However, most of the people with which they interact do not have knowledge about the disease and often carry mistaken conceptions and values about what it is to be a diabetic. Another task for the adolescents with T1DM is to deal with the prejudice of society towards their condition.

Diabetes throughout time

The discourse of the interviewees were analyzed concerning their background and their lives with diabetes, and it was observed that in the past the main memories comprehend the impact of the diagnosis as a non-normative event. Feelings of surprise, fear, sadness and insecurity permeated the past of the three adolescents and their families. After the initial shock and the adaptation to a new routine and specific care, the reports on the past concentrate on the beginning of adolescence, with important changes and new challenges and difficulties. The transition from being cared for by third

parties to performing self-care, an increase in socialization that hinders the diet, the desire to not be different from peers, demands from caregivers, physical limitation and overprotection were some of the difficulties mentioned by the participants. All of these aspects have already been pointed by other scholars in researches with diabetic adolescents within different contexts (Fragoso et al., 2010; Heleno et al., 2009; Tuchman et al., 2008).

In this study, the adolescents perceive the disease in different ways. Camila believes that diabetes has a positive side, affirming that she feels healthier than people without the disease, because she needs to monitor her health constantly. She does not complain about the care routine and believes that time has brought benefits, such as technological advances and experience. Pedro and Daniel believe that as they walk towards adulthood metabolic control becomes harder. According to Cyrulnik (2005), the meaning that each person attributes to the "injuries" of life is of fundamental importance for the manifestation or absence of resilience processes. The negative meaning that Pedro and Daniel attribute to having the disease possibly makes T1DM more difficult to cope.

An important indicator of resilience resides in the capacity and in the desire of individuals to imagine and plan the future (Grotberg, 2006). As for the future, Daniel believes in the discovery of a cure for T1DM, and Pedro also imagines that he will no longer have to live with the disease and that the cure will come with time, naturally. The plans of both of them collide with the diagnosis itself, because Daniel aspires to be a soldier and serve on the field, and Pedro wants to be a football player. Their plans involve a possible cure, something external, and not the result of personal overcoming and adaptation to the requirements of the disease, which would involve personal efforts.

According to Grotberg (2006), the planned future does not consist only of goals to achieve, but of being prepared to face the adversities that might arise along the way. Camila seems to be closer to this conception, with more palpable plans for the future that, somehow, would work as a repair for her condition, since they involve helping other patients with T1DM and taking care of her own health at the same time. Children who have suffered some type of adverse situation are more attentive to the suffering of others, and this altruist trait constitutes a positive defense mechanism essential to the promotion of resilience processes (Cyrulnik, 2005). Camila's future perspective walks in this direction, because she realizes that by living the experience of diabetes she will be able to help other patients, establishing new bonds and searching for different solutions to her own condition, manifesting, in this way, resilience processes.

Conclusions

The results show that the adolescent girl appointed by the team for presenting a better metabolic control is the one who counts with a greater influence of protective factors and, consequently, presents better results before the challenges of living with the disease. The factors that promote resilience processes in the case of this adolescent include her personal characteristics of optimism, altruism, and skills to solve problems; her connection with reference adults; the support network composed of other family members, relatives, peers and health team, and her plans for the future.

On the other hand, it was observed that the adolescents with a non-satisfactory glycemic control and difficulties to comply with and manage T1DM present healthy responses too, such as coping strategies of avoidance, in addition to close and positive relationships with peers and family members. It is understood that, in spite of the presence of risk factors, there are positive factors that can be strengthened. A close look into a more complex case ends up revealing the end of a thread by which one can start to untie the knots. This finding reinforces the conception of resilience as an ordinal phenomenon in which the manifestation of this type of process is not the privilege of a few, but a possibility for many.

The study has some limitations, especially regarding its cross-sectional design. The time passing is an essential factor in resilience studies and in those based on the PPCT model. A longitudinal study would be certainly more effective in the investigation about the impact of time passing on the coping process. Another limitation resides in the possible bias caused by the selection of the sample by convenience, which contemplated more adolescents with coping difficulties.

The results of this study suggest a need for strengthening the dialogue between the different spheres involved in the care to the patient. It is the health team's duty, for its expertise, to favor the relations between the different microsystems, making the mesosystem more integrated and strengthening the protective factors essential to the manifestation of resilience processes. There should be a focus on the stimulation of proximal processes with competence effects, especially in the family context, since the literature is unanimous when pointing the family as the main source of support for an adequate coping in face of T1DM. The effects of time passing, observed in the three cases, also allow comprehending that the work with these patients should emphasize prevention in short, medium and long-term actions.

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