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The Influence of Family Support, Parental Coping and School Support on Adherence to Type 1 Diabetes' Self-Care in Adolescents

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<http://dx.doi.org/10.5772/53062>

1. Introduction

Diabetes Mellitus is a globe and a growing serious public health problem. Type 1 Diabetes is estimated to be one of the five most prevalent chronic diseases in children and adolescents, corresponding to 5-10% of all cases worldwide [1, 2]. Type 1 diabetes is an autoimmune chronic disease resulting from total absence of insulin secretion. In order to replace the absence of insulin production by the cells in the islets of Langerhans, located in the pancreas, it is necessary to administer exogenous insulin [3-5].

Nutrition and physical exercise also play fundamental roles in managing type 1 diabetes, in association with insulin therapy. The nutrition of an adolescent with diabetes should be guided by the principles of healthy eating and by the regular practice of physical exercise, in order to facilitate the control of blood glucose levels, prevent associated complications, maintain body weight within the normal standards and reduce cardiovascular diseases risk factors, providing psychosocial and familiar well-being [6-9]. However, diet and physical activity are the type of self-care activities that adolescents with diabetes are less concerned with [10].

Type 1 diabetes has a multifactorial etiology, in which genetic factors are important, due to modifications in the HLA complex (Human Leukocyte Antigen Complex), behavioral factors, which can include viral infections (enteroviruses, coxsackie virus, congenital rubella) and environmental borne toxins, such as nitrosamines or even food such as the early exposure to cow's milk proteins, cereals or gluten, and in this case, the antibodies produced by

the immune system's T cells to destroy these potentially invading agents also act on the pancreas β cells, destroying them [11-13].

Self-management and self-care is of critical importance for the control of this type of diabetes in children and adolescents. In fact, the responsibility of regularly monitoring the disease and its symptoms and the compliance with the treatment lies with the family and later, in accordance with the growth and the development phase, are gradually transferred to the child/adolescent [14-17]. Therefore, the main goals for type 1 Diabetes Mellitus's treatment, in children and adolescents, emphasize the prevention of symptoms and their severity, the prevention of short and long term complications, and the appropriate growth and development of the adolescent allowing the suitable maintenance of daily activities such as those related to family dynamics, school and social life [15, 18-20].

However, the multiple physiological and psychosocial modifications occurring during adolescence compromise diabetes treatments during this developmental period [15, 21, 22] and often, the adolescent show serious difficulties in adhering to self-care management of diabetes and the prevention of its complications. The conflicts arising from the demands and complexities involved in the self-management of diabetes, and the adolescent's expectations regarding their own experiences, in this developmental phase, may account for this scenario [23, 24].

According to the World Health Organization (WHO), adolescence is placed between 10-19 years, during which the individual is subjected to changes of biological nature, determined by puberty that will produce a rapid growth with consequently distinct body transformations; changes of cognitive nature, with a higher complexity in reasoning skills, through the attainment of autonomy and identity construction and also changes of social nature with the experience of new and different roles [25-27]. However, the constant need to declare autonomy and independence leads the adolescent to idealize feelings of invulnerability, inconsistent with the acceptance of a chronic disease such as type 1 diabetes that may encourage non-adherence to self-care [22].

Parental involvement, communication, cohesion and family conflicts that arise when managing diabetes self-care, are good examples of the type of family support available to the adolescent. A higher level of family conflict and less involvement account for worse outcomes of adherence to diabetes self-care in adolescents [28]. In turn, schools with staff and peers also account from other sources of social support that the adolescent with type 1 diabetes may count on, in daily life, that may influence metabolic control and quality of life [29]. Peer pressure and the demands of the social environment (school, recreational activities and family) may hinder adherence to self-care in adolescents with diabetes [30, 31].

This chapter's main goal is to describe the relationship among family support, school support and parental coping in adolescents with type 1 diabetes on adherence to self-care in order to inform the development of interventions programs to meet adolescents' needs regarding diabetes management.

2. Adherence to self-care in the adolescent with type 1 diabetes

The diagnosis of a chronic condition such as diabetes involves a change in lifestyle as well as the use of therapeutic methods that, at times, adolescents may not have the will or capacity to integrate into their daily lives resulting in risks to their health [32-35]. Considering that the prescribed treatment regimen can be complex, the role of health professionals involved with patient's care is of crucial relevance and intervention should emphasize symptoms' control and the promotion of quality of life [36-38].

There are strong evidences that individuals with chronic diseases, such as diabetes, present difficulties in adhering to the prescribed therapeutic regimes, with the consequent complexities of managing and controlling the disease [39, 40]. However, the literature shows that some adolescents have problems in adhering to a self-administrate treatment regardless of the type of disease or its severity [41].

Non-adherence to treatment of a chronic disease, particularly in type 1 diabetes, embodies a problem of multifactorial etiology and indeed different attempts to explain adherence behavior to prescribed treatments have been proposed [32]. According to the World Health Organization [41], different factors affecting adherence can be classified into five groups: 1) social, economic and cultural factors; 2) factors related to the health services and professionals; 3) factors underlying the disease and the comorbidity; 4) factors related to the treatment and 5) factors related to the patient.

Adolescents with diabetes, in particular, go through a phase of strong psychosocial changes and have to deal simultaneously with the changes of adolescence itself and as well as coping with the demands of controlling the disease treatment specificities [16, 42-45]. The hormonal changes occurring during puberty that cause insulin resistance, the rebelliousness characteristic of this phase, and almost total absence of residual insulin secretion by the pancreas, may complicate diabetes treatment, particularly, adherence [15, 46, 47].

The stigma associated with chronic disease, the need for self-care in social contexts and the risk of hypoglycemia, reinforces the idea that adolescents with diabetes are different from their colleagues and friends, which can lead to a feeling of inferiority and negatively influence adherence to self-care behaviors outside their family and personal context [46, 48, 49]. Since adolescence corresponds to the transition between childhood and adulthood, both families and health professionals encourage and stimulate the independence of these youngsters regarding the management of their diabetes [46, 48, 49]. However, this rapid transition can lead to personal and family conflicts, probably because the adolescent has not developed the necessary maturity to assume this type of responsibility [16]. In fact, management of diabetes can be considered a major challenge for adolescents, worsened by physical and hormonal changes, characteristic of this developmental phase which may lead to frequent changes in the therapeutic regimen [50]. Living with a chronic disease, during adolescence is hard and the adolescent may experience more difficulties in adapting to diabetes [2, 17]. Very often, adolescents with diabetes mention their frustration, stress and anxiety, with a lack of motivation regarding the management of the disease, which may negatively influ-

ence their adherence to self-care. This set of emotions may also hinder the behaviors necessary for adherence to treatment [51, 52].

A chronic condition, such as diabetes, implies a permanent process of compliance with self-care in order to minimize the effects of its progression and, as a result, is often associated with lower therapeutic adherence [14, 49, 53, 54]. The methods aimed at increasing the success of therapeutic adherence can be classified into four main groups: 1) patient education; 2) existing communication between healthcare professionals and patient; 3) dosage and type of drugs and 4) the accessibility of health services to attend the patient [55]. However, evidence showed that through a multidisciplinary approach comprising educational and behavioral interventions, treatment adherence rates can significantly improve, when compared to the strategies that use each intervention separately [56, 57]. So, taking in consideration the different variables that contribute to noncompliance, it is fundamental to consider a multifactorial approach, to the extent that a single approach will not successfully improve patients' adherence to treatment [55].

Adherence to diabetes self-care involves a complex set of daily behaviors that require the frequent monitoring of blood glucose, insulin administration, recommendations about nutrition and physical exercise [58] as well as making changes and adjustments whenever one of these factors changes [47, 59]. Therefore, the complexity of self-care behaviors may explain low adherence rates and may lead to significant suffering, although compliance significantly reduces the incidence and progression of associated complications [60-62]. Positive outcomes regarding adherence may be related to how each adolescent interprets, learns and draws conclusions regarding the meaning of the disease and its treatment [17]. However, some adolescents with diabetes may lie about their self-care behaviors to avoid being reprimanded by their parents or physician [63, 64].

Good adherence to self-care, in adolescents, may be explained by feelings of social acceptance, distorted or optimistic perception of their behavior or by minimizing the importance of strict compliance with the treatment [51, 65]. On the other hand, non-adherence may be related to specific psychosocial characteristics of adolescent's developmental phase [15, 43, 47, 50, 58]. Peer pressure and fear of a negative reaction from the group can lead to loss of support from colleagues, thus increasing the risk of diabetes complications [58]. The demands associated with self-care does not facilitate the adolescent's growing desire for autonomy and both diabetes and its treatment may result and be perceived as limitations in physical activities, and one's lifestyle [44, 66, 67].

Whereas the responsibility for diabetes self-care increases with adolescent's age, compliance follows in the opposite direction, indicating that adolescents show better adherence when they are more in tune with the guidelines and values of their parental figures [50, 66, 68, 69]. In fact, in the late adolescence stage, older adolescents show a greater concern with the body, sexuality and with independence from parents and authority figures what may explain poor results regarding adherence compared to younger adolescents [50, 65, 70-72].

The increase of emotional distress and autonomy and less acceptance of diabetes, due to a higher awareness of the impact of diabetes on the adolescent's identity and psychosocial de-

velopment, may also negatively influence adherence to self-care [59, 72-75]. Generally, adolescents tend to have worse outcomes regarding the administration of insulin, the practice of physical exercise, nutrition care and self-monitoring of blood glucose, when compared to children [39, 76]. However, a greater knowledge of diabetes and long experience with the disease decreases attitudes of denial, allowing the adolescent to gradually begin to accept the therapeutic regimen with better results [77, 78]. Also, adolescents who are more responsible for their treatment will have their task of identity formation and psychosocial development facilitated due to the management of their diabetes [65].

Male adolescents have worse adherence to self-care than female adolescents [69], but the latter show higher incidence of depression, eating disorders and psychosocial implications, which may interfere with the process of body image's acceptance [43, 51, 79]. However, literature is controversial regarding gender. A study [80] found male adolescent to present higher levels of adherence to self-care. In other gender related studies, the differences in adherence to self-care were minimal, which may suggest that there are many similarities in the reactions and behaviors of adolescents of both genders regarding their performance in diabetes self-care, meaning that gender may not be considered a risk factor [41, 79, 81].

3. The family support in adherence to self-care

Family impacts on its members' health and the opposite is also true [82]. Family support consists of the individual perception regarding the availability and the caregiving received from their family that allows the development of greater resilience and psychological well-being in the face of stress-inducing events [83-85]. Family support is a complex multidimensional concept associated with the individual's mental health and in direct relation to support received from family members [84, 86, 87]. Hence, family support relates to the behaviors of affection, sensitivity, cooperation and trust, encouraging the autonomy and independence amongst family members [86].

There are numerous types and qualities of support available to families: tangible family support, such as actions that cause well-being among family members; family emotional support, which has to do with empathy, listening, and attention to family members giving advice, which is vital in moments of great difficulties and important decision-making [86, 88]. However, the perception of family support is influenced by personal factors, stable traits and intrinsic changes, in each person, over time [86, 88].

The perception of high levels of family support is associated with a positive disposition [89] and, as a result, when family support is positively perceived, feelings of well being within the family members are promoted [86].

The concept of family support can also be defined as a part of one's informal and close relationship network, benefiting the individual with the exchanges among family members [85]. In this sense, the individual develops greater resilience and psychological well-being, that enables the development of more adjusted responses to stress-inducing events that are

closely related to a better coping with a chronic disease [85, 90, 91]. Therefore, it is necessary for family dynamics to show a set of fundamental aspects which favor the development of family support among its members, such as: 1) congruent, directional, functional and emotional communication; 2) consistent and flexible rules; 3) democratic leadership shared with the offspring; 4) self-esteem, 5) integrated couple's relationship, allowing the family to act as a whole but ensuring each individual's personality [92]. The accomplishment of these functions, in association with the perception of the family as loving, cohesive and with clear boundaries, provides members with important tools for individual growth as well as providing its members with a support system [92].

In situations of chronic disease, family support proves to be an important resource in self-care behaviors for adolescent, with a direct correlation between the perception of family support and an increased motivation for self-care behaviors and health in general [82, 90, 93]. This support appears to be of greatest importance in children and adolescents who experience high levels of stress due to a chronic condition and may also affect their development and the quality of their social relationships within their family system [94-96]. However, on one hand, some families become so close that its members are attached, in a way that may affect the autonomy of the patient and, on the other hand, there are families who may become more distant due to the strain that the disease imposes on the family [82]. Within this perspective, a family providing support, affection, guidance and adjusted strategies to solve problems, establishes and promotes best conditions for adherence to self-care, evidencing its responsibility in sharing diabetes' self-care activities with the adolescent [14, 97]. In fact, the family is the main source of support in chronic disease, whether through tangible support, such as preparing meals, administering the medication and in the daily care or through emotional and social support ([82, 90]. Both family and friends influence the control of diabetes, regarding compliance with the medical treatment, diet and the practice of physical exercise [98, 99].

Family support represents an important factor in understanding treatment adherence in adolescents with type 1 diabetes, helping the adolescent to adapt to the demands of the disease and consequently to diabetes self-care. A low family support is a good predictor of poor adherence to self-care in diabetes [73, 100, 101].

Family organization significantly affects family health behaviors in the same way that individual's health also affects the family. Therefore, the family is a resource of strategic importance, since it may or may not help the adolescent with diabetes to properly manage the disease and to achieve treatment's goals [90]. Family support entails emotional and behavioral benefits for its members and is therefore, a reciprocal and proactive process with both parties benefiting from its positive effects, which are particularly important in adolescents who experience high levels of stress, such as in the process of a chronic disease [94, 99]. In the case of diabetes, a direct relationship between family support, characteristics of adolescents with diabetes and therapeutic adherence has been found [70, 82]. The family can act as a support unit for the adolescent's daily self-care tasks, such as motivating physical activity and compliance with the nutrition plan and encouraging insulin administration, after receiving proper guidance, [71, 90].

Regarding diabetes' treatment, parents are considered the major providers of social support, even more than peers. Those adolescents, whose parents are less involved and therefore less supportive, show lower adherence to self-care behaviors [70, 102, 103]. The existence of good communication, good skills for an effective resolution of problems and conflicts and flexibility among family members are essential conditions for the adolescent to effectively adapt to the demands of diabetes [17]. Therefore, parental support is positively associated with adolescents' adherence to the prescribed therapeutic regimen [98, 104-106]. In a study involving adolescents with diabetes, a higher family support was a good indicator of adherence to self-care, suggesting the influence that perceived family support has on the implementation and management of diabetes in the daily life of adolescents [107]. In fact, family support appears to have a direct effect on adolescents' adherence to self-care through direct parental supervision on self-care activities. The authors found family support to be a moderator between adolescents' adherence to self-care and quality of life i.e. when family support was high, a positive relationship between adherence and quality of life was found [108]. However, the adolescent may sometimes perceive family support as invasive [109, 110]. In fact, diabetes may modify the process of adolescent's development and family dynamics, and the psychosocial tasks of progressively acquiring autonomy and independence, on the part of the adolescent, may be affected. Therefore, the family's challenge relies on allowing the adolescent to acquire independence with the consequent constraints associated with diabetes, without being super-protective [111].

Given the specific tasks and behaviors in managing diabetes self-care, family support was significantly higher among younger children and in those where the disease was more recently diagnosed [70, 82].

Diabetes requires from the adolescent, family and health professionals a set of efforts in order to achieve a good metabolic control and reduce future complications [112]. Family's participation and collaboration play an important role when it comes to ensure the well-being of the adolescent with diabetes [111].

4. Adherence to self-care and parental coping

Coping is related to efforts, whether cognitive or behavioral, used by the individual to face internal or external demands caused by a specific stress-inducing situation [113, 114]. Coping also implies a dynamic process depending on individual differences and circumstances occurring throughout life [115-117].

Given that coping is a changing process, the individual is not limited to a single coping strategy, since changes will occur resulting from the assessment of stressful situations [116-118]. For this reason, the individual can begin the process by using a strategy and later keep the same strategy, change it or use a combination of different strategies, as the relationship with the environment changes [119, 120].

Coping strategies represent actions, thoughts or behaviors to cope with a stress-inducing event that may, according to their function, be subdivided into two types: emotion-focused

coping and problem-focused coping [119, 121, 122]. Emotion-focused coping concerns the efforts to regulate the emotional state that is associated with stress or results from stressful events ([17, 119]. These efforts are directed to somatic sensations or feelings, in order to transform the emotional state manifested by the individual; this type of strategies seeks to minimize the unpleasant physical sensation caused by a state of stress. Problem-focused coping consists of making an effort to act upon a stressful situation, by trying to change it [119, 122, 123]. This type of strategy aims to modify the existing problems in the relationship between the individual and the context that caused the tension [17, 124]. Therefore, coping actions can be directed either inwardly or outwardly [125, 126]. The first type includes strategies such as cognitive restructuring and the latter includes negotiation strategies to resolve an interpersonal conflict or request help from other individuals [125, 126]. In this sense, the process of coping is considered a mediator between the stressful situation and its consequences, whether by focusing on the problem or on the emotion, and its main purpose is to improve the emotional state that results from the confrontation with the stressor [123].

In the case of a chronic disease, coping presents itself as a dynamic process that changes over time, according to the objective demands and the subjective assessments of the situation involving changes in thoughts and actions [115-117, 127]. In addition to personal requirements, defined goals, external resources, such as social support from family, friends and health professionals, economic resources and internal resources, such as intelligence, resilience and locus of control and the characteristics of the disease and treatment are also factors that impact the disease evaluation process that is stress-inducing [118, 120]. As a result, each person has a subjective understanding of the disease, personal attitudes and behavior towards the illness that corresponds to coping mechanisms behind the biomedical factors influencing the course of the disease. Disease severity does not seem to have a consistent relation with the coping used by an individual in adjusting to a chronic disease but coping systems are significantly influenced by psychological and social factors [128].

As a chronic disease, diabetes implies adaptations in terms of physical exercise, food and socializing with peers, that are considered stressful triggering a process of psychological adaptation, with consequent changes in family dynamics [129]. The entire adapting process depends on both the complexity and the severity of the disease, impacting on the stability of the family structure and the development of coping strategies. However, in most cases, parents of children and adolescents with diabetes develop effective coping strategies to manage the diabetes' demands, even if some may show more difficulties and problems adapting to this disease [130, 131].

Chronic disease can be understood as a stress-inducing event affecting the normal development of the child and disturbing the social relations within the family system, changing family routines with constant medical consultations, medication and hospital admissions [96, 132]. Thus, parents and adolescents' psychological resources and the family structure interact and contribute to the adolescent's adaptation to diabetes [96]. The inadequacy of the adolescent can be related more with how the family deals with the sick adolescent, than with the behaviors of the adolescent [96, 132]. As a result, family routines change and the family must adapt to living with a sick child, since strict relationship patterns may influence the

adolescent's emotional development. Parents should be enlightened and aware of the specific diabetes' treatment demands, so that the adolescent does not become depressive and/or distressed [129]. Some studies show, after the diagnosis, that some mothers of children or adolescents with a chronic disease, have trouble sleeping and present a significant emotional impact with associated feelings of concern, fear and responsibility [133].

There is a greater responsibility for mothers in the daily care of a child with diabetes. Often, is up to the mother to accompany the child/adolescent to the medical consultation, keep monitoring records of the blood glucose, guide the child regarding diet and care about the daily insulin administration [134, 135]. Sometimes, when a child is diagnosed with diabetes, parents' responses can lead to a family breakdown that may consequently influence the whole process of adapting and adjusting, by family members, to a chronic disease [133]. This situation can occur after the diagnosis, when the family ceases to participate in social events trying to avoid the ingestion of sweets and cakes hiding from the discomfort of having to relate to others in social situations [135]. Thus, parents who intensify the relationship of dependence and protection regarding the adolescent, as a coping strategy, start to lead their lives according to the child's needs and this process may become very tiresome for parents after a while [136].

Sharing specific tasks for diabetes management between the family and the adolescent, increases the later's knowledge about diabetes. The use of assertive behavior, in social contexts, is considered to be an adjusted strategy to cope with the disease and encourages adaptation. Disease management in diabetes can be stress-inducing, both for the adolescent and for the family, and disturb the harmony of the family dynamics [131].

In most cases, either the adolescent or the family may not act appropriately regarding diabetes, and ultimately fail to accomplish self-care tasks and may even lie regarding blood glucose monitoring if afraid of the disapproval or criticism from health professionals [135].

5. School support in adhering to self-care

School plays an important role in controlling diabetes, in adolescents, given the association between keeping proper self-care during normal school activities and good disease management and quality of life [29, 137, 138]. The school context can contribute to improve the acceptance of diabetes and adolescent' self-esteem and, consequently, have a positive influence on diabetes self-care, due to the continuity of diabetes care during school activities, allowing the adolescent to actively participate in school, reducing school interruptions and absences and ensuring the safety and the prevention of diabetes associated complications [138-140]. However, many adolescents tend to feel uncomfortable in pursuing diabetes self-care in the school environment, because they do not feel safe and properly supported, which could be one of the possible barriers, to adhere to diabetes self-care tasks [138, 141-144]. Also, the lack of knowledge of school teachers and other professionals about diabetes, unhealthy and limited food choices, the unfavorable school organization and class rules unfriendly for diabetes management may have a negative impact on adherence and cause

feelings of discrimination among adolescents with diabetes [138, 141, 142, 145, 146]. Along with these barriers, the lack of private places for administering the insulin, which has to be done often in inappropriate places such as the bathroom, the absence of locations for adolescents with diabetes to keep the materials needed for diabetes self-care and the indifference of school staff regarding symptoms and difficulties expressed by these adolescents, may also negatively influence adherence [142, 147, 148].

For parents of teenagers with diabetes, the existence of well-informed teachers regarding diabetes and a proper school structure to receive students with this health condition, are considered the main support that school needs to provide for diabetes management in adolescents [29]. In a school environment, the strongest support comes from teachers and peers [107, 141]. Consequently, it is essential to improve communication between the family and the school, to improve the education of school professionals, to develop healthy menus in the canteen and cafeteria and also to have nurses available to take care of adolescents with diabetes or other chronic diseases, when needed, as well as promoting the education of school staff, students and teachers regarding diabetes, the same way as the school has learned how to care and accommodate students with special education needs [149].

Social support from the peer group has been rated as one of the most important resources for adolescents with diabetes, given that friends tend to provide more companionship and emotional support for self-care behaviors than family members [29, 106, 47, 150, 51]. Social support from peers significantly influences adolescent's adherence to self-care, with strong evidence suggesting that this support improves metabolic outcomes [31]. Despite the differences between the type of support provided by the family and peers, both types of support are also complementary, since the family provides more support in daily tasks, such as insulin administration and meal preparation, while friends provide more emotional support in relation to the practice of physical exercise and glucose monitoring contributing to a better psychological adjustment to diabetes [150, 152-155]. In fact, friends and peers allow the adolescent to enjoy moments of fun and relaxation, contributing to the successful management of diabetes. However, conflict situations between the adolescent with diabetes and peers, although normal and appropriate for psychosocial development, are associated with worse metabolic results, especially in female adolescents [156-158]. In turn, older adolescents, despite having better skills in problem solving, are more vulnerable and prone to peer group pressure regarding diabetes self-care which is associated with worse metabolic outcomes [159, 160]. The way adolescents cope with the need to be part of the group and treated the same way as other members may explain the secrecy regarding diabetes and its symptoms, in an attempt to avoid a negative impact on their social image if significant others find out about their disease [105, 161, 162].

A study on the influence of school and family support on self-care, in adolescents, found that these two types of support act as moderators in the relationship between the quality of life and adherence to the treatment, so when school support and family support were perceived as high, in adolescents with type 1 diabetes, good quality of life was positively related to good adherence [108].

Young people report having more difficulty in adhering to self-care activities in the school context and with their peer group [31, 138, 153, 154, 160, 163, 164]. The anticipation of peer pressure and the fear of being discriminated influence adolescents not to follow adherence to diabetes regimen, which means higher risks regarding their health [165]. In fact, interaction with the peer group and the social context influence adherence to self-care either through positive attitudes, such as the companionship of friends, or through negative attitudes, such as prejudices related to the adolescent's food choices [153, 160, 166]. However, a study on the relationship between adherence and peer support did not reveal a strong relationship probably due to the role that cognitive attributions and evaluations play: if positive, they may be considered a protective factor, if negative, adolescent adjustment to chronic disease may be negatively influenced [152]. Yet another study found that support from peers and teachers, as well as satisfaction with the support received, were associated with good metabolic control, in diabetes [137].

6. Conclusion

Psychosocial and physiological demands, typical of the adolescent's developmental phase and the intensive and demanding characteristics of diabetes treatment influence adherence to diabetes self-care. However, the support from family, peers and school play, an important role in managing and controlling diabetes by adolescents, who tend to present better adherence to self-care behaviors when support is perceived as appropriate. Therefore, intervention programs designed to promote adherence to diabetes self care in adolescents should also include family members and take in consideration the social context of adolescents.

In terms of family support, it is important for adolescent to have access to tangible support from the family in preparing food, monitoring the levels of glycemia and in administering insulin. However, if a high family support is associated with good adherence to the self-care, sometimes too much family involvement can entail a negative influence if the adolescent perceives this support to be a barrier to the development of his/her identity and autonomy. Consequently, it is also important for intervention, in diabetes, to include conflict resolution skills, self-efficacy and stress management strategies for both the adolescent and the family.

Coping strategies adopted by parents in order to deal with daily tasks and challenges, that diabetes management implies, interfere with the organization of family dynamics and impact on adherence to diabetes self-care. Given that the effectiveness of coping strategies influence adherence, it becomes important for parents and adolescents to integrate self-help groups or even family therapy, when they have trouble adapting to diabetes management.

Diabetes is a disease that requires constant monitoring and surveillance even within social contexts outside the family environment, as in the case of peer group activities. The support from both the school and the peer group impacts on adherence outcomes in adolescents. As a result, education regarding diabetes in schools is important, in order to improve knowl-

edge about the management of diabetes and also to make support and resources more efficient and appropriate regarding diabetes self care's behaviors in the school context.

Finally, psychological interventions must also acknowledge the implications of diabetes on the adolescent's lifestyle in order not to jeopardize the development of autonomy, independence and social skills and instead, promote normal psychosocial development of the adolescent in the family, school, and other significant social environments.

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