Original Article

Perception of social support by individuals with diabetes mellitus and foot ulcers*

Percepção do apoio social pela pessoa com Diabetes mellitus e úlceras nos pés

Percepción del apoyo social de la persona con Diabetes mellitus *y úlceras en los piés*

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ABSTRACT

Objective: To evaluate the perception of social support and the relationship of sociodemographic, clinical and metabolic control variables in individuals with diabetes mellitus and foot ulcers in an outpatient unit. **Methods:** A quantitative cross-sectional approach was carried out using a social support network inventory. **Results:** Participants had a high perception of social support; family and health professionals were identified as the main support sources. Fasting plasma glucose values were directly related with social support. **Conclusion:** Family members were identified as the main support source, which emphasizes their importance in the health care process.

Keywords: Diabetes mellitus; Diabetic Foot; Social Support

RESUMO

Objetivo: Avaliar o apoio social percebido e sua relação com as variáveis sociodemográficas, clínicas e de controle metabólico em pessoas com Diabetes *mellitus* e úlceras nos pés, em seguimento ambulatorial. **Métodos:** Estudo de abordagem quantitativa, seccional, realizado por meio do Inventário da Rede de Suporte Social. **Resultados:** Houve elevada percepção de apoio social na amostra estudada, e as principais fontes de apoio foram os familiares e os profissionais da saúde. No estudo da relação entre o AS e as variáveis sociodemográficas, clínicas e de tratamento, não houve correlações estatisticamente significantes. Quanto às variáveis de controle metabólico, o valor da glicemia plasmática de jejum apresentou relação direta com o apoio social. **Conclusão:** A família foi a fonte de apoio mais apontada, reiterando sua importância no processo do cuidado à saúde.

Descritores: Diabetes mellitus; Pé diabético; Apoio social

RESUMEN

Objetivo: Evaluar el apoyo social percibido y su relación con las variables sociodemográficas, clínicas y de control metabólico de personas con Diabetes *mellitus* y úlceras en los piés, con seguimiento ambulatorio. **Métodos:** Estudio de abordaje cuantitativo, seccional, realizado por medio del Inventario de la Red de Soporte Social. **Resultados:** Hubo una elevada percepción de apoyo social en la muestra estudiada, siendo las principales fuentes de apoyo los familiares y los profesionales de la salud. En el estudio de la relación entre el AS y las variables sociodemográficas, clínicas y de tratamiento, no hubo correlaciones estadísticamente significativas. En cuanto a las variables de control metabólico, el valor de la glicemia plasmática en ayuno presentó relación directa con el apoyo social. **Conclusión:** La familia fue la fuente de apoyo más señalada, reiterando su importancia en el proceso del cuidado a la salud.

Descriptores: Diabetes mellitus; Pie diabético; Apoyo social

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INTRODUCTION

Changes that occur in the feet of people with diabetes mellitus (DM) due to chronic complications or poor glycemic control are responsible for development of ulcers and lower limb amputations[1]. Management of changes that accompany chronic disease states requires specific care and sometimes additional social support (SS) from family members, health professionals or others[2,3].

Foot ulcers compromise quality of life, negatively affecting a person's self-image, self-esteem, and role within society. Physical limitations can also cause social isolation and depression[4,5].

In a previous study that analyzed the effects of SS on quality of life, glycemic control and chronic complications in Portuguese patients with DM a statistically significant relationship was seen between higher satisfaction with SS and a better quality of life (p-value<0.05)[6].

Another cross-sectional study, anxiety levels, depression, psychological well-being and health status were compared among Norwegian adults with and without DM, and with and without a history of foot ulcer. Results of this study showed a history of foot ulcer was significantly associated with a greater frequency of depressive symptoms, lower psychological well-being and perception of health status (p-value=0.002) in those with DM than in those without DM or with other diseases but without history of ulcer[7].

SS is considered a complex and dynamic process involving individuals and social networks that aims to satisfy their needs and to provide and complement available resources; this enables these individuals to face new situations[8]. A cross-sectional study in an outpatient clinic at an academic hospital in São Paulo city identified perception of SS in DM patients without clinical complications due to disease. They also analyzed perceptions relation with sociodemographic variables and found a higher perception of SS; family was appointed as the main source of support. Statistically significant correlations were seen (p-valor<0.05) between SS and age, SS and formal education; the latter had an inverse correlation[9].

In the last two decades, how people and family support influences disease processes and treatment results has became evident[10]. Understanding psychosocial factors such as SS is critical to promote integral care for people with DM. However, studies evaluating perception of SS by individuals with DM and foot ulcers are scarce in the literature[11].

In this paper, we evaluated perception of SS among people with DM and foot ulcers and aimed to identify SS perceptions and analyze the relationship of SS with sociodemographic, clinical and metabolic control variables in an outpatient unit.

METHODS

This quantitative cross-sectional study was carried out from November 2009 to June 2010. The study population was composed of 30 patients in the diabetic foot care service of the Endocrinology and Metabolism Outpatient Unit of Hospital das Clínicas, Faculdade de Medicina de Ribeirão Preto – Universidade de São Paulo, Brazil (HCFMRP-USP). This study was approved by the Research and Ethical Committee of the HCFMRP-USP, process n° 6787/2009.

Participants were identified during their routine weekly visits. The study population included patients 18 years old or older who had DM type 1 or 2, and foot ulcers. All patients agreeing to participate signed the consent form; after that interviews were conducted in a private environment. Interviews lasted from 15 to 40 minutes, on average 24 minutes per interview.

A Brazilian Portuguese translated version of the social support network inventory (SSNI) [12,13] was used to evaluate SS; this instrument has adequate internal consistency (α=0,95)[12]. It evaluates social network variables (source and type of contact) and specific components of social support (availability, reciprocity, practical and emotional support, and support related to an event)[12]. Social network characterizes the structure of social relationships, and the SS defines social interactions occurring between people and their social networks[14].

In SSNI, participants must indicate ten people or a specific group (e.g., church, associations) with whom he or she has a global social network. From this initial list, participants selected at least one or at most five people or a specific group (global social network) who provided the best support[12,13]. After identifying these sources of SS, participants reported their degree or type of relationship with each person/group and answered ten questions regarding their perceptions of the support received.

Seven of the ten questions were answered using a scale of "never", "almost never", "frequently", "sometimes" and "always", with scores ranging from one to five, respectively. The remaining three questions had standard answers that represented the same type of score as the others[13]. A score of one indicated a perception of low SS, with a score of 5 indicating the highest perception of SS[13].

To calculate the score, the points for all questions were added, and then divided by 10 (the number of questions). This was done for each source of SS. The mean score represented the patient's general perception of SS received, that is, from all members of their social network, so that scores for each source of support were summed and then divided by the number of sources rated[12].

Sociodemographic, anthropometric, clinic, metabolic control and treatment data were recorded in previously structured instruments.

Anthropometric data included weight measured in kilograms (kg) using a digital balance with capacity for 200kg, and height measured in centimeters (cm) using a wood stadiometer for adults fixed on the wall without baseboard and with scale of 40-220 cm, both according to a standardized technique. Participants were requested to take off shoes and head ornaments for the height measurement, and instructed to wear only soft clothes. Next, height was converted into meters (m) to calculate body mass index (using the ratio of weight/height squared), and results categorized as normal (<25.0 kg/m^2), overweight (25.0–29.9 kg/m^2) or obese (≥30.0 kg/m^2)[15].

Clinical data included the duration of time the patient had DM (in years), blood pressure, treatments, and laboratory measurements. Arm blood pressure was measured using a digital device model HEM 742-Omron with blood pressure cuff for arms of 22-32 cm using a standardized technique. Two measurements were done, the first in the right arm after five minutes of resting[16], and the second 25 minutes later with the person sitting with their feet on the floor and legs uncrossed. The final value was the average of both measures. The recommendations of The Seventh Report of the Joint National Committee on the Prevention Detection, Evaluation and Treatment of High Blood Pressure[17] were used to categorize variables. Systolic blood pressure <130 mmHg was considered normal, and ≥130 mmHg abnormal. Diastolic blood pressure <80 mmHg was considered normal, and ≥ 80 mmHg abnormal.

Information on treatment included the type of drug used (insulin, oral antidiabetic), mean time of use, frequency of daily application/dosage and type/class.

Laboratory values related to metabolic control were obtained using an internal electronic system (automated enzymatic method for all, except hemoglobin A_{1c} (HbA_{1c}), which was by high-performance liquid chromatography [HPLC]; results of the last 12 months were used to calculate average values. Tests were analyzed and categorized as normal or abnormal using established standards and reference values as follows: glycated hemoglobin A_{1c} (HbA_{1c}) <7%[18]; fasting plasma glucose <130 mg/dL[18]; total cholesterol <200 mg/dL[19]; high-density lipoprotein (HDL) cholesterol >45 mg/dL[19]; low-density lipoprotein (LDL) cholesterol <100 mg/dL[18-19]; triglycerides <150 mg/dL[19].

Data gathered were recorded, doublechecked and and validated in Excel. The database was exported to Statistical Package for Social Science (SPSS) version 11.5 to perform univariate and bivariate exploratory analysis with measures of central tendency (media and median) and variability (standard deviation). Pearson correlation coefficient was used to analyze the relationship between SS and continual variables. Strong correlation was verified using the classification as weak ($r < 0.3$), moderate ($0.3 < r < 0.6$) and strong ($0.3 < r < 0.6$)[20]. The Student's t-test and the analysis of variance (ANOVA) were used to analyze the relationship between scores of SS and categorical variables. The significance level used was 0.05.

RESULTS

Sociodemographic, clinic, treatment and metabolic control characterization

Participants varied in age between 34 and 85 years old (mean 57 years) DP=12.2). Of 30 participants, 17 (56.7%) were men, 20 (66.7%) married/cohabitant, and all (100%) had a low level of formal education (media of 3.5 years of education; DP=1.4). Time of diagnosis on average was 16.7 years (DP=7.0). Approximately 84% of participants were overweight and obese; 63.3% and 83.3% had normal values for systolic and diastolic blood pressure, respectively.

Insulin was the most frequent medication (60%) with a mean time of use of 9.8 years; daily frequency was 2.3 times a day; and type of insulin used by almost all participants (57.1%) was a mix of NPH and regular insulin. Mean time of oral antidiabetic use was 8.3 years; daily frequency of dosage was 2.5 times a day; biguanides (83.4%) were used most commonly.

Excluding total cholesterol, most participants (data not shown) had high values of HDL and LDL cholesterol and triglycerides, which suggested inadequate metabolic control. The mean fasting plasma glucose value was 145 mg/dL (DP=61,3), and the mean glycated hemoglobin value was 9.5% (DP=2.3) after analying only glycemic control. Of 30 participants, 19 (63.3%) had a fasting plasma glucose ≥130 mg/dL, and 28 (93.3%) glycated hemoglobin ≥7%.

Social network and perceived social support

Each patient's global social network and also partial social network consisted of three persons on average, but varied from one to ten, with the upper limit defined by the IRSS instrument. the The most common main source of support was family members (26 participants, 86.7%), followed by health professionals (8 participants, 26.7%) (Table 1).

Table 1. Source of support mentioned by participants. Ribeirão Preto, SP, 2010

Source of support (n=30)	n(%)
Families	26(86,7)
Health professionals	8(26,7)
Friends	3(10)
Church/Associations	2(6,7)
Boss/work colleagues	1(3,3)

Total mean of SS was 4.3 (DP=0.5), showing higher perception of SS by participants in scale pointed of 1-5 (with a score of 5 indicating more support). Data on evaluation of SS are provided in Table 2.

Table 2. Perception of support evaluated in the group studied. Ribeirão Preto, SP, 2010

Dimensions	IRSS
Number of items by source of support indicated	10
Total of items in the instrument	50
Possible interval	1 – 5
Interval obtained	3 – 5
Mean (DP)	4.3 (0.5)
Medium	4.4
Cronbach's alpha (α)	0.91

Perception of SS evaluation by IRSS could vary from 1 to 5, with scores of 3 to 5 observed in this sample (Table 2).

Although not the aim of this study, the confiability of IRSS was estimated by the Cronbach's alpha coefficient and indicated adequate internal consistency (α=0,91).

Social support relation with sociodemographic, clinic, treatment and metabolic control variables

No statistical significance was found between SS and age (r = -0.03; p-value= 0.99) or between SS and formal education (r = 0.12; p = 0.53). No statistical significance difference was seen in mean of SS scores related to gender variables (t = -1.236; p = 0.23) and marital status (t = -0.206; p = 0.84).

Likewise, no statistical significance correlations were seen between SS and time of diagnosis (r = -0.27; p = 0.14), SS and systolic blood pressure (r = 0.24; p = 0.19), SS and diastolic blood pressure (r = 0.27; p = 0.15), and SS and body mass index (r= 0.18; p = 0.34).

For the treatment variables, any statistical significant differences were seen in mean of SS scores in relation to type of drug therapy, as well as any statistical significant correlations were perceived among SS, time of use of insulin/oral antidiabetic medicines and daily frequency of application / dosage of medicines (data not shown).

For the metabolic control parameters, a direct correlation and statistical significance (r= 0.48; *p*=0.02) between SS and fasting plasma glucose suggested that the higher the perception of SS, the higher the value of the variable.

DISCUSSION

In this study, most participants were men with a mean age of 57 years, who has a low level of formal education, and were married or a cohabitant. Excluding gender, this sociodemographic resembled that of a study using the same population profile but without disease complications[9]. Because this study focused on patients with DM and foot ulcers, the prevalence of men was expected because of the number of studies in the literature pointing to a higher frequency of diabetic foot in men[21].

Participants of this study were affected with DM for a long period of time, which predisposed them to develop chronic complications especially related to the feet. In 2005 a Brazilian study carried out in Recife (PE) pointed the prevalence of 9% of diabetic feet in the municipality[22].

On average, the global social network and partial social network of participants consisted of three people. This differed from a study of people without disease complications who had six people in their global social network and four to five in their partial social network. Family members, however, were identified as the main source of support, suggesting that Brazilian families offer mutual support, which agreed with a previous study[9]. Health professionals were the second most common source of social support mentioned, a fact that could be explained by the frequent visits to clinics

and hospitals for dressing changes. For some patients, these health visits represent a break from their usual social isolation, which the patients perceive as a great support source[23].

Complications associated with DM could create greater dependency and also be perceived as a limitation of social activity, resulting in an underestimation of the amount of SS received[24]. Regarding perceptions of SS, the mean of scores in this study resembled those seen in a study that had patients who did not have complications of advanced disease[9], which seemed to have a relationship between foot ulcers and perception of SS.

A cross-sectional study including Portuguese people with DM that evaluated effects of SS in quality of life, metabolic control and complications of development did not find statistical significance in perception of SS among people with and without chronic disease complications[6]. The relationship between SS and sociodemographic variables such as gender and marital status were different from variables as age and formal education[9]. Interestingly, controversies have been seen in the literature regarding SS with formal education and other socioeconomic indicators[25]. Although this study did not find statistical significance in the mean of SS between genders, some reviews have indicated that women perceive SS less than men because they often provide more support themselves, taking care of household responsibilities, children and aged parents, activities that require more psychological effort as a consequence of social involvement[26].

A study that evaluated humor among people with disability did not find evidence that married people are more open to provide support than single people; however, in the case of a couple in crisis, is it likely that the presence of one does more harm than good to the other[27]. On the other hand, another cross-sectional study analyzing causes of foot ulcers in Brazilian adults with DM suggested that single people and/or widowers may have greater difficulty in preventing foot problems because of physical, cognitive or sensorial limitation and old age that might interfere with self-care[28]. Therefore, family support is critical to help to prevent foot problems[29].

The lack of a relationship between SS and sociodemographic variables could be attributed to the small sample size in this study, indicating the need for a larger study population.

When analyzing clinical variables and treatment with SS, no statistical significant correlations were observed. These results resembled those observed in a study that analyzed the relationship between social support, adherence to treatment and metabolic control in adult Finns with DM. However, that study used a different instrument in which no relationship between this variable and time of diagnosis was seen[30].

The results of this study regarding the relationship between SS and metabolic control were consistent with those of a study that analyzed the relationship between gender and SS in metabolic control of adults with DM type 2; in the latter study, men with a good perception of SS had worse metabolic control, while greater satisfaction with SS was associated with better metabolic control in women[31]. Both studies were similar in relation to SS and glycemic control; however, in this study a multivariate analysis was not done to investigate the relationship of gender and metabolic control with SS due to the number of participants.

A descriptive study including adults older than 20 years with DM type 2 showed that family support score was higher in the group with excellent glycemic control than in the group with satisfactory or poor glycemic control[32]. However, another study including adults older than 60years with DM type 2 analyzing the same variables did not find the same associations[33].

In a study using both qualitative and quantitative approaches to examine the perception of behavior in families providing support or not to people with DM type 2 showed an association between the lack of support with lower adherence to drug therapy and poor glycemic control. It suggested that improving adherence would indirectly enhance glycemic control. But, the same study did not find an association of these variables with a family support behavior[34].

From this viewpoint, the behavior of family members could have a positive or negative effect on the health of people with DM, contributing or not to improving self-care and to relieving deleterious effects of stress on glycemic control[35].

In this study some limitations must be considered. First, the cross-sectional study design allowed evaluation of SS only one time, which did not allow for identifying the influence of ongoing events in perception of support. Second, to evaluate SS using questionnaires does not appear to reflect actual supportive behaviors, especially because each individual's experience can influence his or her perception.

Another possible explanation for the low number of statistically significant correlations was the homogeneity of our study population in sociodemographic, clinical and treatment characteristics. Further research should be done with a larger population to better analyze the relationship between SS and the other variables.

CONCLUSION

In this study, we did not observe a highly statistically significant correlation between SS and sociodemographic and clinical variables. However, a significant correla-

tion was seen between SS and fasting plasma glucose, which is fundamental to metabolic control.

The total of individuals that composed the social network was lower than the number of participants, however, there was a difference related to source of perception of SS. Family members were identified as the main source of support.

Questions raised by this study include the difference between previous studies and the density of social network. Such questions could be attributed to gender or to possible difficulties related to compromised movement due to foot ulcers.

It is important to emphasize that knowing the process and structure of SS allowed improved understanding of the effect of people's social relationship in this study and, ultimately, how such relations could be more feasible and promote healthy and protective behaviors.

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