SELF-CARE OF USERS WITH DIABETES MELLITUS ENTERED INTO A PROGRAM OF CAPILLARY BLOOD GLUCOSE SELF-MONITORING

Autocuidado de usuários com diabetes mellitus inseridos em um programa de automonitorização da glicemia capilar

Autocuidado de los usuarios con diabetes mellitus entrado en un programa de la sangre capilar automonitorización de la glucosa

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ABSTRACT

Objective: To evaluate the performance of self-care activities of users with diabetes mellitus entered into a program of capillary blood glucose self-monitoring at home. **Method:** cross-sectional study, descriptive, with a quantitative approach, held at the domicile of users with diabetes mellitus that perform capillary blood glucose self-monitoring, totaling a sample of 279 users. In the evaluation of the activities of self-care Questionnaire was used of Self-care activities with Diabetes, and to collect demographic and clinical data was applied a systematic roadmap. **Results:** the data revealed that the specific power supply dimensions, physical activity and monitoring Glycemic demonstrates behavior of self-care is not desirable, while drug membership presented the best self-care behavior desirable. **Conclusión:** users with diabetes mellitus that perform capillary blood glucose self-monitoring at home require a specific accompaniment, plus continuous educational practices that foster the effective participation in the activities of self-care.

Descriptors: Diabetes Mellitus, Self Care, Blood Glucose Self-Monitoring, Health Education, Quality of life.

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RESUMO

Objetivo: Avaliar o desempenho das atividades de autocuidado de usuários com diabetes mellitus inseridos em um programa de automonitorização da glicemia capilar no domicílio. **Método:** estudo transversal, descritivo, com abordagem quantitativa, realizado no domicílio de usuários com diabetes mellitus que realizam a automonitorização da glicemia capilar, totalizando uma amostra de 279 usuários. Na avaliação das atividades de autocuidado utilizou-se o Questionário de Atividades de Autocuidado com o Diabetes, e para coleta dos dados sociodemográficos e clínico foi aplicado um roteiro sistematizado. **Resultados:** os dados revelaram que as dimensões alimentação específica, atividade física e monitorização glicêmica demostra comportamento de autocuidado não desejável, enquanto adesão medicamentosa apresentou o melhor comportamento de autocuidado desejável. **Conclusão:** os usuários com diabetes mellitus que realizam a automonitorização da glicemia capilar no domicílio necessitam de um acompanhamento específico, acrescido de práticas educativas contínuas que estimulem a participação efetiva nas atividades de autocuidado.

Descritores: Diabetes mellitus, Autocuidado, Automonitorização da glicemia, Educação em Saúde, Qualidade de Vida.

RESUMEN

Objetivo: Evaluar el desempeño de las actividades de autocuidado de los usuarios con diabetes mellitus entró en un programa de sangre capilar glucosa autocontrol en casa. **Método:** estudio transversal descriptivo con enfoque cuantitativo, celebrada en el domicilio de los usuarios con diabetes mellitus que realizan sangre capilar Self-monitoring de la glucosa, por un total de una muestra de 279 usuarios. En la evaluación de las actividades de autocuidado se utilizó cuestionario de actividades de autocuidado con Diabetes, y recopilar datos demográficos y clínicos se aplicó un plan sistemático. **Resultados:** Los datos revelaron que la alimentación específicos dimensiones, actividad física y control glicémico demuestra comportamiento de autocuidado no es deseable, mientras que miembros de drogas presentaron el mejor comportamiento de autocuidado deseable. **Conclusión:** los usuarios con diabetes mellitus que realizan sangre capilar glucosa autocontrol en casa requieren de un acompañamiento específico, además de continuas prácticas educativas que fomentan la participación efectiva en las actividades de cuidados personales.

Descriptores: Diabetes mellitus, Autocuidado, Automonitorización de la glucosa sanguínea, Educación en salud, Calidad de vida.

INTRODUCTION

Diabetes mellitus (DM) is a public health problem of great magnitude due to its higher prevalence, morbidity, and mortality. It affects people regardless of their socio-economic condition, age and geographical location.[1-2]

Brazil, a developing country, ranks fourth among the countries with the highest number of diabetics.[3-4] The increasing proportion of people with DM associated with its long-term duration and poor glycemic control is a matter of concern. DM can lead to serious complications, such as diabetic retinopathy, peripheral vascular disease, nephropathy, and heart diseases.[5] Such complications reduce the quality of life, limit the social and professional performance of the affected individual, and increase costs to public health care services.[6]

Considering the global scenario, the main obstacle to prevent acute and chronic complications is the difficulty in adhering to treatment, especially in developing countries, in which adherence rates can be less than 50%.[6-7] The treatment for DM is based on nutritional therapy, regular physical activity, pharmacological therapeutic schemes, self-monitoring, and health education.[2] In this framework, the affected individual is responsible for more than 95% of the established therapy. Thus, it is essential to recognize the central role of the individual in the management of his disease and the practice of self-care activities. [8-9]

Self-care refers to the behavior learned and developed by an individual to maintain his/her life, health, and well-being. The human being has the potential to develop intellectual and practical skills integrated with the whole and motivated to achieve self-care.[10] The individual's ability to adhere to daily life activities is affected by basic conditioning factors, so it becomes relevant to continuously monitor users with DM who perform glycemic self-monitoring.[11]

Self-monitoring of capillary blood glucose (SMCBG) is an intervention against DM and an essential tool for directing actions, which allows the individual to evaluate the individual follow-up of the goals established over the treatment.[12] For the SMCBG program to be effective at home and provide favorable results, the user participating in this project must associate his or her treatment with continued education to acquire basic knowledge of and skills in self-care, especially in SMCBG.[13-14]

Considering the complexity of DM and the importance of self-care activities associated with effective glycemic control by users participating in the SMCBG home program, studies of this nature can provide important information to direct care activities and planning of health determinants regarding the control of the disease and reduction of illnesses. Hence, this study is aimed at assessing the performance of self-care activities performed by patients with DM participating in the SMCBG home program.

METHODS

This cross-sectional, descriptive study with a quantitative approach was conducted with patients with DM participating in the SMCBG home program from 2011 to 2016. The participants were registered by the Municipal Health Department of the *Vitória de Santo Antão* city, *Pernambuco* state, Brazil.

The base population used in this study was 1931 registered users from 2011 to 2016. The sample was obtained by a random selection of study participants. To this end, a sample calculation was previously performed considering the self-care behavior of patients with DM performing SMCBG at home as an outcome variable. An initial sample of 297 users was obtained. Inclusion criteria were patients with types 1 and 2 DM participating in the

SMCBG home program aged 18 years old or more. The exclusion criteria were registered users with insufficient location data or with cognitive deficit making it impossible to fill out the questionnaire. Thus, six users were excluded because of outdated home addresses, eight users had died, and four users refused to participate in the research. Therefore, 279 users participated in the study, considering a 95% confidence interval and a 5% sampling error.

Data collection took place in September 2017 through personalized interviews conducted by a previously trained team. Furthermore, a standard operating procedure for data collection at the user's home was established to standardize data collection. Each interview lasted from 10 to 15 minutes.

Initially, a systematic script was applied to obtain the following sociodemographic variables: gender, age, education, marital status, family income, occupation. Moreover, the following clinic variables were assessed: diagnosis, time of illness, medical appointment, type of treatment, medication and medication's institution of origin. This instrument contains 12 closed and semi-open questions.

To collect data on self-care, the Diabetes Self-Care Activities Questionnaire (DSCAQ) was translated to Portuguese, adapted and validated according to the Brazilian culture using the Summary of Diabetes Self-Care Activities Measure (SDSCA). The DSCAQ was developed to systematically evaluate the adherence to self-care activities in diabetic patients. The DSCAQ investigates the activities performed by users with DM and their compliance with the prescription provided by the physician or healthcare professional.[15]

The Brazilian version has six dimensions and 15 items related to the evaluation of self-care performed by patients with diabetes. The following items were analyzed: general feeding behavior, specific feeding behavior, physical activity, glucose monitoring, foot care, medication use.[15]

The analysis of the adherence to the questionnaire items is parameterized in terms of the days of the week ranging from zero to seven. Zero represents the least desirable situation and seven the most favorable one. Regarding the food dimension, when asking questions about the consumption of foods rich in fat and sweets, the values are inverted, as recommended in the original instrument.[15] The evaluation of smoking is coded considering the proportion of smokers, average cigarette consumption and last time of cigarette consumption. An average adherence value is generated for each item concerning the self-care activity performed during the previous week, obtaining adherence to certain care.[15]

After data collection, an Excel spreadsheet was used for constructing a database, which later was analyzed using the *Statistical Package for Social Sciences* (SPSS - version 13.0). Considering that a 7-point Likert-type scale was used, in view of the range of responses, an average of more than four was considered for desirable self-care behavior. This choice was also adopted for those items whose values are inverted and are related to the number of days of the week when the self-care activities were performed. Continuous variables are tabulated according to the mean and standard deviation values. Numerical variables are represented by measures of central tendency and dispersion. The results are presented in tables showing their respective absolute and relative frequencies.

The ethical aspects of the research were respected according to the Resolution No. 466/12 from the Brazilian National Health Council. This study was approved by the Research Ethics Committee of the *Universidade Federal de Pernambuco* under the *Certificado de Apresentação para Apreciação Ética* (CAAE) [Certificate of Presentation for Ethical Appreciation] No. 71260517.5.0000.5208.[16]

RESULTS

Table 1 shows the distribution of the demographic and socioeconomic variables associated with the study participants. Considering the 279 evaluated participants, there was a predominance of females (61.6%) in the age group from 18 to 91 years old, with an average age of 58 years old, and 65.7% reported having nine or fewer years of formal education.

Table 1. Characteristics of the population studied according to the demographic and socioeconomic variables (n=279).

Variable	N	%
Sex		
Female	172	61.6
Male	107	38.4
Education		
Illiterate	29	10.4
Incomplete Elementary School	144	51.6
Elementary School	24	8.6
Incomplete High school	13	4.7
High School	37	13.3
Undergraduate	5	1.8
Graduate	11	3.9
Literate without attending school	16	5.7
Family Income		
Up to 2 minimum wages	257	92.1
3 to 6 minimum wages	19	6.8
Over 7 minimum wages	3	1.1
	Average ± SD	**Minimum - Maximum**
Age (full years)	58.4 ± 12.3	18.0 - 91.0

SD: standard deviation.

Table 2 shows the users' characteristics in terms of clinical variables. Regarding the options for medication and non-medication treatment on the questionnaire, the user could select more than one option, which is in accordance with prescribed therapy.

Table 2. Characteristics of the population studied according to clinical variables and those related to them. (n=279)

Variable	N	%
Type of Diabetes		
Type 1	27	9.7
Type 2	98	35.1
Cannot inform	154	55.2
Current treatment*		
Oral Antidiabetic	201	72.0
Insulin	190	68.1
Diet	179	64.2
Physical Exercises	92	33.0
Health care institution for follow-up*		
Basic Health Unit	207	74.2
Basic District Health Unit	4	1.4
Outpatient room	2	0.7
Health plan	2	0.7
Private practice	27	9.7
Family Health Strategy Unit	2	0.7
	Average ± SD	Minimum - Maximum
Time of illness	12.1 ± 9.3	1.0 - 50.0
Last medical appointment (months)	5.7 ± 9.3	1.0 - 60.0

SD: standard deviation
*The participant could choose more than one option

Table 3 demonstrates the evaluation of the items associated with the DSCAQ.[5]

Table 3. Results of the application of the DSCAQ about the self-care activities among patients with DM participating in the SMCBG program at (n=279).

DSCAQ	Frequency (days of the week)		Average ± SD
	0 a 4 n (%)	5 a 7 n (%)	
General Feeding Behavior			
1. Being on a healthy diet (D)	86 (30.8)	193 (69.2)	5.0 ± 2.8
2. Following food guidelines (D)	173 (62.0)	106 (38.0)	2.8 ± 3.3
Specific Feeding Behavior			
3. Eating five or more servings of fruit/vegetables (ND)****	136 (48.7)	143 (51.3)	3.9 ± 3.1
4. Eating red meat and/or whole milk (ND)****	166 (59.5)	113 (40.5)	3.5 ± 2.5
5. Eating candy (ND)****	15 (5.4)	264 (94.6)	6.4 ± 1.2
Physical Activities			
6. Performing physical activities for at least 30 minutes (D)	214 (76.7)	65 (23.3)	2.1 ± 2.6
7. Performing specific physical exercises (D)	246 (88.2)	33 (11.8)	1.1 ± 2.1
Blood glucose monitoring			
8. Evaluating blood sugar (D)	238 (85.3)	41 (14.7)	1.9 ± 2.3
9. Performing the recommended number of blood sugar evaluations (D)	243 (87.1)	36 (12.9)	1.6 ± 2.3
Feet Care			
10. Assessing the feet (D)	90 (32.3)	189 (67.7)	4.8 ± 3.2
11. Assessing the inside of shoes before putting them on (D)	92 (33.0)	187 (67.0)	4.8 ± 3.2
12. Drying interdigital spaces after washing the feet (D)	74 (26.5)	205 (73.5)	5.2 ± 3.0
Medication***			
13. Taking medicines as recommended (D)*	15 (5.5)	258 (94.5)	6.6 ± 1.2
14. Taking insulin injections as recommended (D)**	15 (7.9)	175 (92.1)	6.5 ± 1.4
15. Taking the recommended number of diabetes pills (D)***	10 (5.0)	191 (95.0)	6.6 ± 1.3

SD: standard deviation; D: desirable; ND: not desirable
*Six users did not undergo any medication treatment
**83 did not use insulin
***72 did not use oral antidiabetics
****Reverse score
*****Sample size different from 279 because some users did not use the medication.

DISCUSSION

According to the study results, the highest frequency of DM was associated with females, corroborating the results of the Brazilian National Health Survey (NHS) carried out in 2013, which reported the highest number of DM diagnoses among women.[17] The high prevalence of females may be associated with their increased demand for health care services, which increases the chances of early diagnosis in this population. On the other hand, men are less likely to seek medical assistance due to psychosocial and cultural factors.[18]

Lower educational level is a determining condition for the follow-up of self-care activities, as it can make it difficult for users with DM to perceive the therapy chosen to control the disease.[19] Users with fewer years of study may have difficulty in accessing health care services and using the resources from public health services adequately.[20-22] The participants' precarious education may justify their low adherence to treatment. However, this sociodemographic characteristic is a modulable factor that can be increased through health education programs, which reflects the importance of knowledge support for this population.

Users with type 2 DM, who have longer diagnostic time, may have greater knowledge about the disease and a better understanding and management of the treatment regimen, resulting in greater adherence to treatment.[23] TESTON et al.[9] point out that users presenting a diagnostic time of DM ≥ 10 years recognize their role in the control of the disease, but are not able to have a proactive behavior. The patients with active self-care behavior are not persevering over time and give up because they do not see results in the short term. Possibly, users participating in the SMCBG program who have a longer duration of illness and low adherence to treatment may have tried to adapt themselves to the changes in daily life and feel discouraged by the lack of immediate results.

The study findings reinforce the importance of introducing a health education program designed to specifically monitor these users participating in the SMCBG home program. Although health education is necessary so that these users could continue to perform self-care actions, they stop the treatment on their own because they do not understand the importance of self-care practices, do not feel supported by health care services or are unaware of techniques that minimize the discomfort caused by the chosen therapy, such as the application of insulin.

In this perspective, it is highlighted the importance of strengthening the recommendations for self-care[4,7,9,11,24] through education directed to the care while dealing with the disease. Also, each user's life context and expectations related to managing the disease should be considered. Care planning based on educational strategies strengthens the individual's responsibility for his/her health and makes him/her an active participant capable of modulating biological states through human behavior.

VIERIA et al.[25] concluded that users already have well-established living habits before being diagnosed with DM, which makes it difficult for them to adopt new eating habits, especially because they are linked to cultural and social factors. In addition, studies[9,24-26] have shown that when health care professionals establish a diet very difficult to maintain or do not consider the users' financial condition, it creates an obstacle to the adoption of healthy habits. Continued monitoring favors knowing the reality of the life of the users performing the SMCBG at home and establishes a bond, which makes the food guidelines less

restrictive and strengthens the determination to achieve goals.

Users performing the SMCBG do not recognize physical activity habits as an important therapeutic resource in the pursuit of self-care and this circumstance occurs due to the lack of guidance by health care professionals on this modality of treatment.[27] A study[26] found that factors such as discouragement, discomfort, lack of knowledge and medical restriction are seen by users as barriers to performing physical activities.

The self-monitoring of glycemic values is a self-care measure that should be exercised by all patients with DM.[26] To ensure the effectiveness of the SMCBG at home, the difficulties related to the reading and interpretation of the results should be considered, as well as the training of health care professionals for proper guidance on the use of the resources provided by the program.[27] It is noticeable that simply distributing glucose verification inputs to patients without providing proper guidance on the SMCBG discourages the effective practice of this activity.

In this context, it should also be emphasized that the SMCBG program analyzed in this study is not associated with an educational program for monitoring the patients. Therefore, this reality is possibly attributed to the underutilization or inappropriate use of SMCBG resources at home.

Some studies,[24,26] in which the DSCAQ was used for the evaluation of feet self-care, reported high adherence to necessary behaviors toward the feet. This adherence resulted from the guidance provided by health care professionals aiming at preventing chronic complications. Despite the high scores presented for foot care activities, it is necessary for health care professionals to continuously reinforce, through educational interventions, the guidance given to users performing self-care activities.

Regarding medication adherence, several studies[24,26-27] showed that users with DM consider drug adherence important, maintaining the appropriate practice of the established therapeutic scheme. These data corroborate the study findings, in which medication use was considered pertinent by the users performing the SMCBG at home. However, attention should be paid to the number of users who take insulin incorrectly, since this result can be explained by lack of skill, discomfort, and fear during insulin application.

According to CORRÊIA et al,[28] health education is a fundamental component for DM management and control. SOUZA et al.[24] add further that some users with DM performing the SMCBG may adhere to self-care activities, emphasizing that this reality can be reversed through education focusing on the user as the protagonist of his care, contributing to better glycemic control.

Hence, according to the self-care activities analyzed, some measures considered essential for the maintenance and control of the disease were undesirable because they presented a value lower than the expected average, behaving as undesirable self-care measures. However, it should be noted that the study sample consisted of users registered in the SMCBG program to be carried out at home. They did not have the support from any educational group regarding the monitoring of self-care activities. Therefore, it is clear that there is a need for educational strategies to support this public policy aimed at adherence to self-care practices and better glycemic control.

As a limitation of this study, it is important to note that there is no education program in the municipality in which the study was carried out that pays attention to users participating in the SMCBG home program, resulting in different interpretations of the results by this population. On the other hand, it is worth noting the low number of Brazilian studies addressing the use of specific instruments to evaluate the self-care behavior of users participating in the SMCBG home program. Therefore, it is suggested that other studies on this subject should be conducted.

CONCLUSIONS

The study results showed that among the self-care activities performed by users with DM performing the SMCBG, specific diet, physical activity, and glycemic monitoring were regarded as non-desirable self-care behaviors. Therefore, we conclude that the lack of self-care activities among these users is related to the absence of a specific health education program to monitor them. The reason is that ongoing educational practices and innovative strategies stimulate the effective participation of users with DM in self-care activities.

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