Amandaba in the Caeté: culture circles as an educational practice in the self-care of patients with diabetes

Amandaba no Caeté: círculos de cultura como prática educativa no autocuidado de portadores de diabetes

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ABSTRACT The aim of this study was to evaluate the pedagogical strategy of Paulo Freire's culture circles in adherence to self-care in patients with Diabetes Mellitus. A randomized clinical test was performed with 72 participants, allocated into Intervention Group (IG) and Control Group (CG).The IG participated in six circles to discuss and unveil the generative themes: diet, medication, diabetes complications and foot care; the CG participated only in routine consultations. The change provided by the circles after three months of intervention was evaluated through the Diabetes Self-Care Activity Questionnaire, fasting capillary glycemia, systolic and diastolic arterial pressure, body mass index and abdominal circumference. The IG showed a statistically significant increase in self-care adherence to healthy diet, physical exercise, glycemic monitoring and examination and drying of the feet and reduced fasting capillary glycemia (211.6 ± 102.5 to 181.9 ± 66.3 mg/dL), systolic arterial pressure 125(120-140) to 120(117.5-130 mmHg) and abdominal circumference (96.3 ± 9.5 to 95.5 ± 9.1 cm), while in the CG there were no changes during the study. The culture circles, as an educational approach, were able to improve the self-care adherence practices of patients with diabetes and provide improvement in some cardiovascular risk parameters.

KEYWORDS Health education. Diabetes Mellitus. Self care. Family Health Strategy.

RESUMO *Objetivou-se avaliar a estratégia pedagógica dos círculos de cultura de Paulo Freire na adesão ao autocuidado em pacientes com Diabetes Mellitus. Foi realizado um ensaio clínico randomizado com 72 participantes, alocados em Grupo Intervenção (GI) e Grupo Controle (GC). O GI participou de seis círculos para problematizar e desvelar os temas geradores: alimentação, medicação, complicações do diabetes e cuidados com os pés; o GC participou apenas de consultas de rotina. Foi avaliada a mudança proporcionada pelos círculos após três meses de intervenção, por meio do Questionário de Atividades de Autocuidado com o Diabetes, glicemia capilar em jejum, pressão arterial sistólica e diastólica, Índice de Massa Corpórea e circunferência abdominal. O GI apresentou aumento estatisticamente significante na adesão ao autocuidado à alimentação saudável, prática de exercício físico, monitoramento glicêmico e exame e secar os pés e redução da glicemia capilar em jejum (211,6±102,5 para 181,9±66,3 mg/dL), pressão arterial sistólica de 125(120-140) para 120(117,5-130 mmHg) e circunferência abdominal (96,3±9,5 para 95,5±9,1 cm), enquanto no GC não houve modificação durante o estudo. Os círculos de cultura, como abordagem educativa, foram capazes de melhorar as práticas de adesão ao autocuidado dos pacientes com diabetes e proporcionar a melhora em alguns parâmetros de risco cardiovascular.*

PALAVRAS-CHAVE *Educação em saúde. Diabetes Mellitus. Autocuidado. Estratégia Saúde da Família.*

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Introduction

Diabetes Mellitus is one of the most emerging chronic conditions of the 21st century, and its complications are the main causes of death in many countries[1]. Due to the chronicity and severity of complications, it is considered an onerous disease, both for the individual and his/her family and for health services[2].

The estimate of people in the world with diabetes, in 2015, was 415 million, while in Brazil this estimate corresponded to 14.3 million (9.4%) of Brazilians with the chronic condition1. In the State of Pará, the proportion of people from 18 years of age who reported having diabetes was 3.8%[3]; in Belém, the data from Vigitel (2016) shows a proportion of 6.6%[4].

Diabetes, as a chronic disease that requires continuous and permanent health care, which goes beyond clinical treatment, requires the patient to adopt lifestyle changes and develop self-care skills in order to control the disease[5].

Health education, being a lightweight technology[6] that provides knowledge, skills and abilities essential for the self-care of people with diabetes and their families, helps patients make decisions, self-manage the disease, solve problems and actively collaborate with the team health in clinical control and quality of life[7].

One of the health education approaches, used in the health field since the 1970s, is the Culture Circle ('Amandaba' in Tupi-Guarani), a pedagogical model of educator Paulo Freire[8]. In it, the environment is different from that of the traditional classroom, in which students, when they are arranged in a circle, favoring interaction and dialogue among themselves, will learn and teach each other[9].

In this model, which uses problematization, the fundamental piece is the dialogue that seeks to bring the subjects closer, promoting their critical reflection, autonomy and empowerment, seeking, collectively, to improve their understanding of reality and transform it[10,11].

It is worth remembering that, in 2013, Ordinance nº 276 instituted the National Policy for Popular Education in Health, proposing political-pedagogical practices that mainstream actions aimed at the promotion, protection and recovery of health, considering principles such as dialogue, love, problematization, shared construction of knowledge, emancipation and commitment to building a democratic and popular project[12]. Thus, the Culture Circle is a methodology with a democratic and liberating character, whose integral learning breaks with the fragmentation of reality, encouraging the horizontality of the educator with the student, valuing culture and the human being, favoring critical sense, problem solving and the transformation of reality[9].

The Culture Circle, according to Heidemann[8]; Brandão[9]; Freire[10], is developed in the following phases: survey of the vocabulary universe/thematic survey, carried out through informal meetings, interviews and/or observations of reality by the circle coordinator, who raises the words, the words, the emotional content themes, the typical speech of the students; choice of generating words/themes that are selected by the circle coordinator, from the group's vocabulary universe and that implies social, cultural, political reality, etc of the student, who are presented in circles for debate; problematization of the situations experienced by the group, through the codification and decoding of the generating themes debated by the students within circles (to produce the debates, the culture cards are used, which are drawings/images related to the generating themes); critical unveiling, which aims to become aware of the situation experienced and which, through a critical view, transforms its reality.

Thus, health education, focused on diabetes care, carried out in this dialogical, reflective and critical perspective, can be an effective instrument for the formation of critical knowledge, expanding the patient's understanding and autonomy in the face of conditions of life

and diabetes[13]. Therefore, the present study aimed to evaluate the pedagogical strategy of Culture Circles in adhering to self-care in patients with Diabetes Mellitus.

Material and methods

Randomized clinical trial developed with users with Diabetes Mellitus monitored in the units of the Family Health Strategies (FHS), in the urban area of the municipality of Bragança (PA), in the Brazilian Amazon, located along the banks of the Caeté or Caité River ('good bush' in the Tupi language).

The study was approved by the Research Ethics Committee of the Institute of Health Sciences, of the Federal University of Pará, with the opinion CAEE 57049416.9.0000.0018, and was guided by the ethical principles of Resolution nº 466/2012. All participants signed the Free and Informed Consent Form after receiving verbal and written explanation about the objective of the study, about the procedures to be performed, about the risks and benefits of their participation.

The sample was calculated based on the population aged 30 to 60 years (of both genders), with four units (n=4) being raffled off for the Control Group (CG) and four units (n=4) for the Intervention Group (IG). Thus, the calculated sample would be of 244 users with diabetes belonging to them, who were invited. However, 166 people refused to participate due to the concurrence of the meetings with the working day. Two users were also excluded for presenting nephropathy, two for neuropathy with limited mobility and three for retinopathy, with low visual acuity.

CG participants were offered the units' routine actions, such as: medical consultation and individual guidance from the professionals who work in the units. IG participants underwent health education activities based on Paulo Freire's Culture Circles and were instructed to continue individual care at the unit, as a routine.

The Culture Circles were planned, organized and conducted by the researcher, who was identified throughout the educational process as coordinator of the Circle[9]. The researcher had no connection with the health units, being a person external to the places where the intervention was applied. Six circles were held, bimonthly, with two-hour sessions, over a period of three months, in the auditoriums of the health units in the user's area of residence.

The Circles were designed according to phases[8-10]: a) thematic investigation; b) choice of generating themes; c) problematization; d) critical unveiling. In all phases, welcoming dynamics were carried out, with the aim of creating a bond between the pairs.

The thematic survey was carried out by the circle coordinator, based on the observation of conversations and analysis of the Diabetes Self-Care Activities Questionnaire (QAD)[14], which was applied at the first meeting with the participants. The survey and selection of the themes took place by assessing the non-adherence to self-care practices in the daily lives of participants. Topics raised by the coordinator: food, physical exercise, blood glucose monitoring, foot care and complications of diabetes.

In the next phase, choosing the generating themes, the presentation and reception of the participants was initially carried out. Then, a dynamic[15] was used, in which phrases related to living with diabetes were placed inside balloons. The coordinator asked each participant to inflate a balloon, play with it for five minutes and reflect on the following question: what are the challenges in having diabetes? After playing with the balloons, the participants popped them and read the sentence, reflecting on the generating question launched to the group, thus initiating a discussion among the participants about diabetes, guiding the choice of the most important generating themes for the group to be discussed: diabetes and complications, food, medication and foot care.

In the problematization phase, these generating themes were addressed through photos, drawings, illustrations and texts, with the aim of fostering dialogue between the participants. In addition, foot care was stimulated through the practical activity of examining the feet carried out among the pairs participating in the group. The phase of critical unveiling happened concurrently with the phase of problematization, because, when talking about the generating themes, analyzing them critically, the participants became aware of their reality, systematizing their ideas in the face of self-care in diabetes. Therefore, after the problematization, the group was encouraged to express, through speeches, drawings, words written on a sheet of paper, which decision making about self-care with diabetes they started to have, from the discussions in the group.

There was also a circle for the closing of the group intervention, in which the group was asked to make the evaluation of the Culture Circles method. For this purpose, the coordinator elaborated the dynamics called Self-Care Tree: a tree made with paper cut was used, and a fruit-shaped card is handed over to the participants, where they described feelings, perceptions about the educational intervention, opening for discussion and final questions.

Evaluation of participants

In order to compare the result of the intervention for the adoption of self-care among the participants of the CG and IG, the QAD[14] was applied and capillary blood glucose was collected, in addition to measurements of weight and height for the calculation of the Body Mass Index (BMI), abdominal circumference and systolic and diastolic blood pressure, for each participant. This procedure was repeated after three months, differently from the sociodemographic questionnaire, applied only at the project presentation meeting.

The QAD, translated version and validated into Portuguese[14] of the Summary of Diabetes Self-Care Activities Questionnaire (SDSCA)[16], measures adherence to self-care by users with type 2 Diabetes Mellitus. It has six dimensions and 15 items for assessing self-care with diabetes: general food (with two items), specific food (three items), physical activity (two items), blood glucose monitoring (two items), foot care (three items) and 'medication use' (three items, used according to the medication regimen). In addition, they contain three other items for the assessment of smoking. Responses vary from zero to seven days, with scores indicating the performance of self-care activities in the last seven days of the week, with zero being the least desirable situation and seven being the most favorable. Only in the second and third items of the specific food question did the zero score indicate the most favorable; and seven, less desirable.

The collection of capillary glycemia in an 8-hour fasting to 12-hour fasting occurred by means of glucometer and reagent strips, total blood was collected from digital pulp using sterile lancets[7]. Arterial pressure was measured by a single examiner after five minutes of rest, three measurements with a one-minute interval, in a sitting position, using the auscultatory method using an aneroid sphygmomanometer with stethoscope, following the guidelines of the VI Brazilian Guidelines of Arterial Hypertension[17]. Weight and height measurements were performed using a Welmy-branded scale with precision of 0,1 kg and 1 cm, for weight and height, respectively. BMI was calculated by the ratio of weight (Kg) to height squared (m^2)[18]. Finally, the abdominal circumference was verified by a single meter in the equidistant line between the lower margin of the costal arch and the iliac crest, measured by an inelastic and flexible anthropometric tape with an accuracy of 0,1 cm[18].

Statistical analysis

The Kolmogorov-Smirnov test was applied to analyze the normality distribution of the variables. The difference between the

CG and the IG at the baseline and the difference in each group before and after the intervention were tested using the Student t-test for two independent samples or dependent samples if the variable shows normal distribution with results in mean and standard deviation. If the variable shows nonparametric distribution, the Mann-Whitney test for two independent samples was used or the Wilcoxon test for intra-group comparison before and after the intervention period, with the variables presented in medians and quartiles 25 and 75. The difference between proportions was assessed by the corrected Chi-square test. Values of $p<0.05$ were considered statistically significant. The SPSS 20.0 software was used for statistical analysis.

Results

The study population consisted of 72 users with diabetes, 41 from the IG and 31 from the CG. Women accounted for 73.6% of the participants, the average age was 49,9 years, and education corresponded to 6 years of complete studies. There was no statistically significant difference between the IG and CG groups regarding gender, age, marital status, years of study, active workers and income, as shown in *table 1* below.

Table 1. Sociodemographic characteristics of the participants in the Intervention and Control Groups. Bragança, PA. 2017

Sociodemographic Characteristics	Intervention Group (n=41)	Control Group (n=31)	p
Gender, n (%)			**0.524***
Man	12 (29.3)	7 (22.6)	
Woman	29 (70.7)	24 (77.4)	
Age (years) (average±SD)	**49,2±7,83**	**51,0±7.30**	**0.500****
Marital Status, n (%)			**0.616***
Married/Steady union	30 (73.2)	21 (67.7)	
Single/Divorced/Widower	11 (26.8)	10 (32.3)	
Years of study (median, Q25-Q75)	**6 (4-8)**	**6 (3-9)**	**0.895*****
Active or retired worker, n (%)			**0.418***
Active	37 (90.2)	26 (83.9)	
Retired	4 (9.8)	5 (16.1)	
Type of Occupational Activity, n (%)			**0.957***
Service provider/commerce	12 (29.3)	10 (32.3)	
Housework	21 (51.2)	16 (51.6)	
Farming/fishing	8 (19.5)	5 (16.1)	
Income (Reais) (median, Q25-Q75)	**937.00 (0.00-1.171.25)**	**468.00 (0.00-937.00)**	**0.266*****

Source: Own elaboration.

* Chi-Square Test. ** Student's T test. ***Mann-Whitney test.

Analyzing the clinical parameters and capillary glycemia at the baseline of the study, there was no statistically significant difference between the two groups *(table 2)*. The groups presented high fasting capillary glycemia, with an average of the IG of 211,6 mg/dL; and the CG of 174,2 mg/dL. The average of the BMI indicated the existence of overweight in both the IG and the CG *(table 2)*.

Table 2. Comparison of clinical variables and capillary blood glucose between the Intervention and Control Groups at the baseline. Bragança, PA. 2017

Variables	Intervention Group (n=41)	Control Group (n=31)	p
Diagnostic time (years) (median Q25-Q75)	2 (1-5)	3 (1-7)	0.330*
Capillary glycemia (mg/dL) (average±SD)	211.6±102.5	174.2±67.4	0.219**
SBP (mmHg) (median, Q25-Q75)	125 (120-140)	120 (110-135)	0.246*
DBP (mmHg) (median, Q25-Q75)	80 (70-90)	70 (70-90)	0.642*
BMI (Kg/m^2) (average±SD)	28.6±4,9	27.3±5.7	0.89**
Abdominal circumference (cm) (average±SD)	96.3±9.5	95.1±9.6	0.887**

Source: Own elaboration.

* Mann-Whitney test. ** Student's T test. SBP: Systolic Blood Pressure. DBP: Diastolic Blood Pressure. BMI: Body Mass Index.

The QAD assessment at the baseline of the study indicated that there was a statistically significant difference between the groups in three items: the IG ate candy 1 day a week, while the CG did not eat; the IG did not examine the shoes before putting them on, however, the CG examined the shoes from 0 to 7 days a week; IG dried the spaces between the toes after washing them for 7 days a week, and CG, only 3 days *(table 3)*.

The QAD made it possible to identify that the items 'took your diabetes medications' and 'took the indicated number of pills' were those that had the greatest adherence to self-care in both groups; and the items 'practiced some type of specific physical exercise' and 'assessed blood sugar the recommended number of times' had the lowest adherence among group participants. It should be noted that, in the item 'examined inside the shoes before putting them on', the IG participants had not adhered to this self-care on any day of the week. Adhesion to insulin could not be assessed due to the lack of users, as all participants used oral medication for diabetes *(table 3)*.

Table 3. Comparison of items in the Diabetes Self-Care Activities Questionnaire (QAD) according to the time of adherence in the Intervention and Control Groups at the baseline. Bragança, PA. 2017

Items of the QAD	Intervention Group (n=41)	Control Group (n=31)	p*
	Median (Q25-Q75)	Median (Q25-Q75)	
Followed a healthy diet	3.0 (0.0-3.5)	3.0 (0.0-7.0)	0.301
Followed nutritional orientation from a health professional	3.0 (0.0-3.0)	2.0 (0.0-5.0)	0.647
Ate five or more portions of fruits and/or vegetables	3.0 (2.0-4.5)	3.0 (1.0-7.0)	0.658
Ate red meat, food with whole or derived milk	3.0 (2.0-5.0)	3.0 (2.0-5.0)	0.903
Ate candy	1.0 (0.0-1.0)	0.0 (0.0-1.0)	0.034
Performed physical activity for at least 30 minutes	1.0 (0.0-3.0)	2.0 (0.0-6.0)	0.400
Practiced some kind of physical exercise	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.101
Rated blood sugar	1.0 (0.0-1.0)	0.0 (0.0-1.0)	0.903
Rated blood sugar as recommended	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.324
Had feet examined	0.0 (0.0-3.0)	2.0 (0.0-7.0)	0.110

Table 3. (cont.)

Items of the QAD	Intervention Group (n=41)	Control Group (n=31)	p*
	Median (Q25-Q75)	Median (Q25-Q75)	
Looked inside the shoes before putting them on	0.0 (0.0-0.0)	0.0 (0.0-7.0)	0.042
Dried the finger spaces after washing them	7.0 (3.0-7.0)	3.0 (0.0-7.0)	0.042
Took your diabetes medication	7.0 (5.5-7.0)	7.0 (2.0-7.0)	0.056
Took your insulin injection	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.867
Took the indicated number of pills	7.0 (5.0-7.0)	7.0 (0.0-7.0)	0.104

Source: Own elaboration.

* Mann-Whitney test.

When comparing the studied variables of the IG participants at baseline and after three months, a reduction in fasting capillary glucose was observed from 211,6±102,5 mg/dL to 181,9±66,3 mg/dL, blood pressure systolic from 125(120-140) mmHg to 120(117,5-130) mmHg and abdominal circumference from 96,3±9,5 to 95,5±9,1 cm *(table 4)*. In the CG, there was no statistically significant difference in the parameters evaluated during the study period *(table 4)*.

Table 4. Comparison of clinical variables and capillary blood glucose at baseline and after three months in the Intervention Group and in the Control Group. Bragança, PA. 2017

Variables	Intervention Group (n=41)			Control Group (n=31)		
	Basis	3 months	p	Basis	3 months	p
Capillary glycemia (mg/dL) (average±SD)	211.6±102.5	181.9±66.3	0.020*	174.2±67.4	180±69.7	0.685*
SBP (mmHg) (median, Q25-Q75)	125(120-140)	120(117.5-130)	0.045**	120(110-135)	120(110-130)	0.323**
DBP (mmHg) (median, Q25-Q75)	80(70-90)	80(70-90)	0.968**	70(70-90)	80(70-90)	0.693**
BMI (Kg/m²) (median, Q25-Q75)	28(25-31,5)	28(25-32)	0.065**	27(23-29)	26(25-29)	0.284**
Abdominal circumference (cm) (average±SD)	96.3±9,5	95.5±9,1	0.001*	95.1±9.6	95.2±9.5	0.557*

Source: Own elaboration.

* Student's T test. ** Wilxocon test. SBP: Systolic Blood Pressure. DBP: Diastolic Blood Pressure. BMI: Body Mass Index.

The intra-group comparative results for the QAD at baseline and after three months are shown in *table 5*.

In the IG, there was a statistically significant increase in the number of days of adherence to a healthy diet, following a health professional's dietary guidance, eating five or more portions of fruits and/or vegetables, practicing some type of physical exercise, assessing blood sugar the recommended number of times, examine the feet, dry the spaces between the toes after washing them and take the indicated number of pills. In the group, there was a reduction in the number of days of consumption of red meat, foods with whole milk and dairy products, and also candies *(table 5)*.

In the CG, there was a statistically significant increase in adherence days only in activities taking diabetes medications and taking the indicated number of pills, with a decrease in

adherence days to a healthy diet, eating five or more portions of fruits and/or vegetables, eating red meat, foods with whole milk or dairy products, practice physical activity, examine the feet and examine inside the shoes before putting them on *(table 5)*.

Table 5. Comparison of items in the Diabetes Self-Care Activities Questionnaire (QAD) at baseline and after three months in the Intervention Group and in the Control Group. Bragança, PA. 2017

Itens of the QAD	Intervention Group (n=41) Median (Q25-Q75)			Control Group (n=31) Median (Q25-Q75)		
	Basis	3 months	p*	Basis	3 months	p*
Followed a healthy diet	3.0 (0.0-3.5)	4.0 (3.0-5.0)	0.006	3.0 (0.0-7.0)	2.0 (0.0-3.0)	0.008
Followed nutritional orientation from a health professional	3.0 (0.0-3.0)	4.0 (3.0-5.0)	0.003	2.0 (0.0-5.0)	2.0 (0.0-3.0)	0.166
Ate five or more portions of fruits and/or vegetables	3.0 (2.0-4.5)	4.0 (3.0-5.0)	0.003	3.0 (1.0-7.0)	2.0 (2.0-3.0)	0.017
Ate red meat, food with whole or derived milk	3.0 (2.0-5.0)	2.0 (1.0-3.0)	0.000	3.0 (2.0-5.0)	3.0 (2.0-3.0)	0.027
Ate candy	1.0 (0.0-1.0)	0.0 (0.0-1.0)	0.008	0.0 (0.0-1.0)	1.0 (0.0-1.0)	0.387
Performed physical activity for at least 30 minutes	1.0 (0.0-3.0)	2.0 (0.0-3.0)	0.847	2.0 (0.0-6.0)	0.0 (0.0-3.0)	0.002
Practiced some kind of physical exercise	0.0 (0.0-0.0)	0.0 (0.0-2.6)**	0.005	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.180
Rated blood sugar	1.0 (0.0-1.0)	1.0 (0.0-1.5)	0.086	0.0 (0.0-1.0)	0.0 (0.0-1.0)	0.827
Rated blood sugar as recommended	0.0 (0.0-0.0)	1.0 (0.0-1.5)	0.001	0.0 (0.0-0.0)	0.0(0.0-1.0)	0.090
Had feet examined	0.0 (0.0-3.0)	5.0 (3.0-7.0)	0.000	2.0 (0.0-7.0)	0.0 (0.0-3.0)	0.000
Looked inside the shoes before putting them on	0.0 (0.0-0.0)	0.0 (0.0-2.0)	0.970	0.0 (0.0-7.0)	0.0 (0.0-0.0)	0.001
Dried the finger spaces after washing them	7.0 (3.0-7.0)	7.0 (6.0-7.0)	0.009	3.0 (0.0-7.0)	1.0 (0.0-5.0)	0.241
Took your diabetes medication	7.0 (5.5-7.0)	7.0 (7.0-7.0)	0.106	7.0 (2.0-7.0)	7.0 (7.0-7.0)	0.004
Took your insulin injection	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.655	0.0 (0.0-0.0)	0.0 (0.0-0.0)	0.317
Took the indicated number of pills	7.0 (5.0-7.0)	7.0 (7.0-7.0)	0.047	7.0 (0.0-7.0)	7.0 (6.0-7.0)	0.007

Source: Own elaboration.

*Wilcoxon Test. 25 Percentile – 80 Percentile.

There was no statistically significant difference between IG and CG at baseline in relation to smoking. It was found that 37 (90.2%) of the participants in the IG and 30 (96.8%) in the CG had not used cigarettes in the last seven days (p=0,280); and, of these, 4 IG users (9.8%) and 1 CG user (3.2%) smoked on the day of the interview, while 20 (48.8%) participants in the IG and 18 (58.1%) in the CG reported that they never have smoked (p=0,435). After three months of the study, there was no statistically significant change in the smoking

habit, with 39 (95.1%) users of the IG and 30 participants (96.8%) of the CG maintaining the non-use in the last seven days (p=0,728), three participants (7.3%) from the IG and one from the CG (3.2%) reported smoking on the day. Therefore, 20 (48.8%) remained in the IG and 18 (58.1%) in the CG who have never smoked (p=0,603).

Discussion

The adoption of self-care practices by the patient can be influenced by several factors, such as life experience, social and cultural aspects, presence of depressive feelings, demotivation, being demanded from the patient, regarding self-care, decision making, control behavior and acquisition of knowledge and skills[19,20]. Therefore, it is important that the health professional recognizes the factors that lead or not to the adoption of self-care, avoiding prescriptive attitudes when approaching patients with diabetes, using motivational and behavioral practices that contribute to the empowerment and autonomy of patients in relation to self-care[21,22].

The Culture Circles developed in this study, as problematizing health education, by valuing participants, their knowledge, their experiences, built an educational process in which the researcher was not the holder of knowledge, but a facilitator of the teaching-learning process[11]. For Heidemann et al.[23(6)], the Paulo Freire's method promotes

> meeting spaces between people, breaking with the hierarchical barriers involved in biomedical logic, democratizing health knowledge, valuing the daily lives, cultures and ways of thinking and living of families, groups and collectives.

For Santos et al.[24], the Culture Circles, as a participative educational practice, which promotes the exchange of dialogue, knowledge and experiences, generate autonomy and transformations in the self-management of diabetes, in the acceptance of this chronic condition and in the patient's responsibility regarding his or her health.

For Paulo Freire[11], people learn what is meaningful to them, therefore, the educational approach must start from the user's knowledge, from their life context, from the obstacles experienced, being important that the health professional respects and values the person's knowledge, which will be essential for reflections and the construction of an understanding about self-care with diabetes.

Regarding the self-care activities analyzed in this study, it was noticed that the use of medication was the most accomplished activity by the participants, which corroborates the studies by Coelho et al.[25]. For these authors, treatment for people with diabetes consists of adopting lifestyle changes, in which patients may or may not use medication. However, when medication is part of diabetes control, patients have better adherence to this self-care than to non-pharmacological treatment, since the drug, when provided by health units, does not generate financial expenses in most cases, stimulating thus, drug therapy as self-care adopted by patients[26]. This fact was observed in the dialogues of the participants of the present study when they considered drug therapy as the most important activity to control diabetes.

Healthy eating was one of the activities that showed less adoptions of self-care by the participants. The barriers they expressed were related to cultural issues, often acquired in childhood, such as the consumption of flour, 'xibé' (a mixture of water with manioc flour, which is often used to accompany fish), very common in the municipality of Bragança and in Pará, and making it difficult to change patients' eating habits[26]. For Salci et al.[27], health care should highlight the individual's cultural aspects, seeking to understand his/her worldview, recognizing the social, family and

financial context experienced by the patient, since these factors may or may not influence healthy eating habits of the population[28].

Food is directly related to some factors that interfere in the prevention or control of diabetes and its harms, and it is necessary to promote health education with a focus on dietary habits that, in most cases, if modified, have the potential to prevent and/or delay complications of this disease[29,30]. Therefore, the dialogue built in the groups on healthy eating, problematizing and unraveling the cultural and financial barriers in the practice of self-care, had as result that the IG participants, more than those of the CG, followed a healthier diet, consuming more fruits and vegetables, and reduced the consumption of fats and candies.

Regarding physical exercise, there was no adherence to this self-care at the beginning of the study. Non-adherence may be related to the lack of time and to the work routine of participants, since, in their understanding, their occupational functions performing domestic activities at home are already considered a way of exercising. However, it is important to mention that domestic services are considered to be physical activities of light intensity[31], and the recommendations for patients with diabetes are the practice of moderate physical exercise, performed for 150 minutes, five times a week, or, then, high intensity physical exercise, lasting 75 minutes, three times a week[13]. Another important point to highlight is that in the municipality where the study was carried out, despite the existence of the Health Academy, a program of the Ministry of Health that has as one of its specific objectives the increase of the population's physical activity, mainly for the prevention and control of chronic non-communicable diseases[32], it was observed that many patients never used this health service, some because they did not know the program, others because they did not feel motivated to move from their homes and to participate in health actions, which refers to the reflection that these patients have not yet been able to see themselves as protagonists in this self-care process. In this sense, it is essential that health professionals perceive the difficulties and barriers presented by users, and seek to create strategies that contribute to raising awareness of the importance of adopting self-care[33]. In this way, knowing and reflecting on the benefits of physical activity in the IG improve the practice of self-care. The practice of regular physical exercise is fundamental in the treatment of diabetes, which in addition to improving glycemic control, decreases risk factors for coronary heart disease, contributes to weight loss and improves the well-being of people with diabetes[30].

Regarding glycemic monitoring, little adherence was seen in this self-care, due to the lack of inputs in health units, a situation that has existed for some months. In the study by Coelho et al.[25], there was also the same difficulty in accessing inputs for the performance of glycemic monitoring by users in Basic Health Units. Another important factor was related to the financial difficulty in purchasing the glucometer and the reagent tapes. It is noteworthy that, in the present study, the average income of participants was R$ 937,00 for the IG and R$ 468,00 for the CG, which does not make the purchase of these inputs a priority. Blood glucose monitoring is important for the participant to assess the individual response to therapy, as he/she can observe whether the recommended glycemic goals are being achieved[7]. So, it is important that users understand what glycemic goal is, since in the GI there was ignorance of this term. Thus, there was a debated about glycemia, glycemic goal and the importance of the patient knowing this parameter and performing the monitoring; and despite the lack of supplies in the health units and financial difficulties of the participants, they understood the importance of self-care, since it was found

that the participants of the IG increased the monitoring of blood glucose after the intervention of the culture circle.

Self-care of the feet also showed low performance by the participants, mainly the practice of examining the shoes before putting them on. Users, who have the habit of using open slippers and sandals, understood that open shoes would not need to be inspected, demonstrating the lack of understanding about recommendations about foot care for people with diabetes[34]. Community Health Workers who participated in some circles reported that guidance on feet is not part of their work routine. The finding corroborates a study carried out by Neta et al.[35], in which it was observed that most participants had never received guidance from the nursing professional on shoe care before putting them on, going against one of the professional's functions, which is help the patient in self-care that promotes the prevention of diabetic foot.

Furthermore, even with the expansion of health service offerings and a greater emphasis on care for chronic diseases, the Ministry of Health focuses on the frequent occurrence of complications with the feet caused by diabetes, something that could be avoided with the good management of health teams for this complication[36], with the importance of an educational approach to prevent foot complications, emphasizing the relevance of daily care with them[7].

The health professional who respects the users' knowledge allows them to relate their life and community experiences with the technical-scientific content passed on by the professional, allowing them to become critical and problematizing subjects on the way to a much needed autonomy that they do not yet have[37].

When the CG was analyzed, it was observed that there was a decrease in healthy eating practices, with less consumption of vegetables and fruits, an increase in the consumption of candies, a reduction in the practice of physical activity and examination of the feet, in addition to an increase in capillary blood glucose and abdominal circumference. Thus, it was noticed that the Culture Circles as an educational intervention for patients with Diabetes Mellitus were efficient in the better adoption of self-care by IG participants, in the reduction of fasting capillary glycemia, systolic blood pressure and abdominal circumference, as well as in the study of Pereira et al.[38]. For these authors, the dialogue experienced, the reports of shared experiences and reflections on attitudes towards the disease are essential for a better knowledge of diabetes, which lead patients to understand their condition as a carrier, revealing changes in habits, with adoption self-care practices, mainly in food, physical activity and foot care[38].

Final considerations

Culture circles were essential in changing attitudes of the participants, who were able to dialogue about the generating issues, problematizing and unveiling them, sharing knowledge, strengthening the autonomy of those involved, enabling a better understanding of self-care in Diabetes Mellitus, reflected in the results obtained.

Even with the support and integration built between the researcher and the participants through the dialogues, it was found that vertical educational practices are still frequent in the municipality where the study took place. The care provided to people with diabetes is still based on the model centered on the health professional, in which there is no bonding, there is no welcoming and humanization in the care provided to patients, which does not allow the comprehensiveness recommended for the patient to be the protagonist of the process[39].

An inversion of this model goes through multiple dimensions, from management to service, considering the user as the protagonist of care. This would imply, for example,

the adoption of a training process in permanent health education in the municipality, recognizing practices and knowledge and, with them, provoking the production of new meanings in doing health. Thus, the perspective of training must be experienced, instead of specific moments and away from users, in the daily encounter between health professionals and between them and users, promoting a process that brings with it the attributes of freedom, creation and transformation, reversing towards the user-centered model[40].

Developing this study, therefore, was relevant for the actors involved, for the academy and for the municipality, thus suggesting the development of a permanent health education plan that encompasses activities aimed at patients, with an emphasis on problematizing methodologies, such as the Culture Circles.

Collaborators

Correa ST (0000-0003-0509-0829)* contributed to the conception, planning, analysis and interpretation of the data; preparation of the draft and critical review of the content and approval of the final version of the manuscript. Castelo-Branco S (0000-0001-6283-0446)* contributed to the conception, planning, analysis, interpretation of data; critical review of the content; approval of the final version of the manuscript. ■

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