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OPERATIVE GROUP: LEARNING STRATEGY IN NUTRITION EDUCATION ON DIABETES

GRUPO OPERATIVO: ESTRATÉGIA DE APRENDIZAGEM NA EDUCAÇÃO NUTRICIONAL EM DIABETES

GRUPO OPERATIVO: ESTRATEGIA DE APRENDIZAJE EN LA EDUCACIÓN NUTRICIONAL EN DIABETES

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ABSTRACT

Objective: Analyzing operative groups as a learning strategy on Diabetes *mellitus* and its relationship with feeding in Health Promotion Centers. **Method:** Uncontrolled intervention carried out through the operative group technique in four 60-minute meetings. Data collection included structured surveys with questions related to the topics addressed before and after each meeting and observation. **Results:** The number of participants varied between 130 and 167 users. In the second and third meetings an increase in the knowledge about the pathophysiology of the disease, signs and symptoms, and feeding, such as partition of meals (p=0.039) and consumption of roots and tubers (p<0.001). Moreover, 57.5% (n=50) reported, after the meetings, they removed the apparent fat from meats; 47.1% (n=41) prepared chicken without its skin; 93.1% (n=81) increased the intake of high-fiber foods; 83.9% (n=73) reduced the intake of oils; and 72.4% (n=63) reduced the intake of sugar, in addition to the increasing the number of meals/day. **Conclusion:** The meetings were capable of providing acquisition of knowledge and contributing to changes in eating habits.

Descriptors: Diabetes mellitus; Feeding; Food and nutrition education; Health services; Primary Health Care.

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RESUMO

Objetivo: Analisar grupos operativos como estratégia na aprendizagem sobre Diabetes *mellitus* e sua relação com a alimentação em Serviço de Promoção da Saúde. **Método:** Trata-se de uma intervenção não controlada realizada por meio da técnica de grupo operativo, efetivada em quatro encontros com duração de 60 minutos. A coleta de dados abrangeu aplicação de questionários estruturados antes e após cada encontro com perguntas relativas aos temas abordados e observação. **Resultados:** O número de participantes oscilou de 130 a 167 usuários. No 2º e 3º encontros observou-se aumento no conhecimento sobre a fisiopatologia da doença, sinais e sintomas e alimentação, como fracionamento de refeições (p=0,039) e consumo de raízes e tubérculos (p<0,001). Ademais, 57,5% (n=50) referiram, após os encontros, retirar a gordura aparente das carnes; 47,1% (n=41) preparar o frango sem pele; 93,1% (n=81) elevação da ingestão de alimentos ricos em fibras; 83,9% (n=73) redução na ingestão de óleos e 72,4% (n=63) de açúcares, além do aumento do número de refeições/dia. **Conclusão:** A realização dos encontros foi capaz de proporcionar aquisição de conhecimentos, além de contribuir para mudanças de hábitos alimentares.

Descritores: Diabetes mellitus; Alimentação; Educação alimentar e nutricional; Serviços de saúde; Atenção primária à saúde.

RESUMEN

Objetivo: Analizar grupos operativos como estrategia en el aprendizaje sobre Diabetes m*ellitus* y su relación con la alimentación en Servicio de Promoción de la Salud. **Método:** estudio de intervención no controlada realizada a través de la técnica de grupo operativo, efectuada en cuatro encuentros con duración de 60 minutos. La recogida de datos incluyó la aplicación de cuestionarios estructurados antes y después de cada encuentro con preguntas relativas a los temas abordados y observación. **Resultados:** El número de participantes osciló de 130 a 167 usuarios. En el 2º y 3º encuentros se observó aumento en el conocimiento sobre la fisiopatología de la enfermedad, signos y síntomas y -alimentación, como fraccionamiento de las comidas (p=0,039) y consumo de raíces y tubérculos (p<0,001). Además, 57,5% (n=50) refrieron, después de los encuentros, quitar la grasa aparente de las carnes; 47,1% (n=41) preparar el pollo sin piel; 93,1% (n=81) elevación de la ingestión de alimentos ricos en fibras; 83,9% (n=73) reducción en la ingestión de aceites y 72,4% (n=63) de azúcares, allá del aumento del número de comidas/día. **Conclusión:** La realización de los encuentros fue capaz de proporcionar adquisición de conocimientos, allá de contribuir para cambios de hábitos alimentares.

Descriptores: Diabetes mellitus; Alimentación; Educación alimentaria y nutricional; Servicios de salud; Atención Primaria de Salud.

INTRODUCTION

Diabetes *mellitus* (DM) is one of the main causes of death and is responsible for around 1.26 million annual deaths in the world[1,2]. The annual costs of the official Public Health System (SUS) with diabetic patients are nearly BRL 463 million, with great part of the resources coming from hospitalizations[3]. In addition, the irreversible complications of the disease, such as arteriopathy, nephropathy and cardiopathy, have considerable impact on the population's life quality[4,5].

The implementation of intervention studies aimed at the nutritional management of people with DM is crucial, as outlined in the "National Plan for Handling Chronic Diseases"[6], and in the "Guidelines for caring for people with chronic diseases in the Health Care Networks and priority care lines"[7], when considering the advance of such disease and the urgent need for controlling it.

In this context, food and nutrition education (FNE) is a key element for carrying out interventions in populations vulnerable to DM, with high prevalence of the disease and/or associated risk factors, in order to direct resources to learning and the acquisition of healthy food habits [1,8].

The organization of groups for collective interventions, particularly with respect to FNE, has been more and more frequent, with the advantages of work optimization, decrease in waiting time for individual attention, active participation of the client in the education process, and greater interaction between the health professionals and the client[8]. In this sense, the Health Promotion Services are highlighted for being environments aimed at the community, for the purposes socialization and stimulation to healthy practices, enabling exchange of knowledge and experiences, especially in relation to health[9].

Among the group approaches, the operative groups methodology covers a set of people with common characteristics who perform a task, interacting and establishing a bond among themselves. It is believed that those social bonds are crucial to learning as they integrate the history of each participant to the path created during the exercise of such process[10,11].

Therefore, the objective of this study was to analyze operative groups as a learning strategy on Diabetes Mellitus and is relationship with nutrition in Health Care Service.

METHODS

An uncontrolled intervention study was developed with users of the Health Academy Program in Belo Horizonte, Minas Gerais, Brazil, from September 2012 to March 2013.

The Health Academy Program (HAP) is a health care strategy of the Primary Care and was instituted in the Brazilian Public Health System (SUS) in 2011. In Belo Horizonte, the program was implemented in 2006, being an inspiration for its implementation nationwide. The HAP has qualified infrastructure and health care professionals who carry out physical activity and healthy feeding promotion activities. Such public equipment work at several places throughout the city, aiming to promote health and contribute to the improvement of the population's life quality[12].

HAP units have physical educators and support from a nutritionist from the Family Health Support Team of their area of influence. Before starting the participation in the activities, the users are assessed by the team for the elaboration of an exercise plan that considers their physical conditions and individual particularities. The physical activities are offered every day of the week in the morning, and the interested person may attend the service three times a week for one hour. Additionally, they get nutritional guidance, according to their needs, aimed at dietary re-education and the consequent adoption of healthier food habits[12].

The study sample was composed of users of both sexes, over 18 years of age and frequent participants of the service activities. Because of the high turnover of users, it was decided to carry out an open group, with the participation in the meetings not being conditioned to the presence of DM.

The meetings were previously scheduled and disclosed to the participants via a bulletin board. The week before it, the dates were verbally reminded during the physical activity classes. The interventions were performed using the operative group strategy, according to the theory by Pichón-Rivière[11], and approached the prevention and treatment of DM.

The activities were elaborated and developed by scholars of Nutrition at the Federal University of Minas Gerais (UFMG) and supervised by a professor-coordinator. The meetings were aimed at the increase of knowledge related to DM, with explanation and discussion of information relevant to the pathophysiology, prevention and treatment of the disease in question[13].

The planning of the operative group was carried out in the following stages:

assessment of demand; *pre-analysis*; *focus and fit*; and *flexible planning*[11].

The *assessment of demand* was carried out through conversations with the users and physical educators, when the need for themes related to DM was identified, considering the doubts and the high prevalence of this condition in the population of the HAP[14,15]. Afterwards, a *pre-analysis* was performed, with data survey and important aspects for the execution of the job, using as a reference scientific studies of the past five years and materials provided by the Brazilian Ministry of Health and by the Brazilian Society of Diabetes[13,16].

In the *focus and framing* stage, the themes of each meeting were defined and organized. Each theme was developed in one or more meetings, with a contextualized approach to the participants' reality[11]. The operative group consisted of four meetings of approximately one hour. The themes addressed covered: **1.** "What is diabetes *mellitus*?"; **2.** "Pathophysilology of diabetes *mellitus*"; **3.** "Feeding of the person with diabetes"; **4.** "Game about diabetes", for a thematic review (Chart 1). The group coordinators helped the participants, with interpretative interventions, to perform their internal reflective activity, enabling the reflection about the development of their external activity (increase in knowledge). The final purpose of each meeting was to empower the members to become aware, awakening them to tackling obstacles which might interfere in the effective change in lifestyle[10,11].

Chart 1: Theoretical content and educational resources adopted in the operative groups of food and nutrition education on diabetes. Belo Horizonte/MG, 2012-2013

Theme	Objectives	Theoretical content	Educational resources
What is diabetes *mellitus*?	Explain what diabetes is and the types.	Definitions and symptomatology of diabetes type 1, type 2 and gestational.	Dialogue about the definition of diabetes in each one's opinion. Representation of the action of insulin at the cellular level with the use of sugar (sugar), a spoon (insulin) and a fork (insulin of a person with diabetes). Explanation and group reflection about the characteristics of each type of diabetes.
Pathophysiology of diabetes *mellitus*	Explain the pathophysiology of diabetes mellitus and the acute and chronic complications of the disease.	Causes, consequences and treatment/control of diabetes type 1, type 2 and gestational.	Dialogue about the causes, consequences and treatment/control methods for diabetes. Thematic illustration with the help of figures that represent the consequences of the disease it is not controlled/treated. Proposal of joint construction of strategies for treatment and control of diabetes.
Feeding of the person with diabetes	Explain about healthy eating for people with diabetes.	Optimum nutrition in diabetes type 1, type 2 and gestational.	Discussion and reflection about food-related issues in the presence of diabetes. The issues were discussed together with the coordinator.
Game about diabetes	Revise the themes approached in the previous meetings.	Reinforcement of the concepts: diabetes, causes, consequences and nutrition.	Quiz for memorization of the themes, discussion of questions and reflections of health-promoting strategies and prevention and management of diabetes.

The *flexible planning* stage was divided into three moments: 1. introduction of the group coordinators and the activity to be developed; 2. execution of the proposed activity; 3. systematization, to provide work assessment[11]. The participants were assessed at the beginning and at the end of each meeting through structured questionnaires about the themes approached. Additionally, an "observer" was included (assigned exclusively to such activity) to freely register the questions and comments of each meeting.

Finally, three months after the end of the activities, a new questionnaire was applied. It had the objective of assessing if the knowledge acquired was capable of enabling changes in eating habits, through a food frequency questionnaire with a list of foods, defined according to the American Diabetes Association[4], and the benefits reported by the participants after the meetings.

Microsoft Excel® was used to design the database and Statistical Package for the Social Sciences for Windows (SPSS) version 19.0 was used for statistical analysis. A descriptive analysis of the data was performed through the calculation of the frequencies and measurements of central tendency (means and medians) and dispersion (standard deviation, minimum/maximum). Kolmogorov-Smirnov test was applied to test the normality of the variables, with presentation of the data as means and standard deviations for those with normal distribution and medians and minimum/maximum values for the other ones. Additionally, Chi-square and McNemar test was used to compare proportions of independent and depen-dent samples, respectively. Level of significance of 5% ($p>0.05$) was adopted for all tests.

In order to meet the requirements set forth in resolution 466/2012, the study was approved by the Ethics Committees of the Municipal Department of Health of Belo Horizonte (017/2007) and of the Federal University of Minas Gerais (328/06).

RESULTS

The attendance at the meeting was: 167 participants in the first meeting, 130 in the second one, 136 in the third one, and 151 in the final activity (Game about diabetes). In the first meeting, in which the definition and the types of DM were discussed, there was no statistically significant difference in the number of hits between pre- and post-tests. As for the second meeting, about the pathophysiology of the disease, there was an increase in knowledge ($p<0.05$) in the questions that addressed DM and the conditions: weight loss, excessive thirst and foot infections. In the third meeting, which addressed the nutrition of the diabetic, there was an increase of hits ($p<0.05$) in the questions about the partition of meals and intake of roots and tubers among the people with diabetes (Table 1).

Table 1 – Evaluation of knowledge (% of hits) pre- and post-intervention. Belo Horizonte/MG, 2012-2013.

Meeting 1: "What is Diabetes *Mellitus*" (n=167)			
Questions	**Pre-test (%)**	**Post-test (%)**	**p value***
Diabetes and sugar in blood	96.17	98.72	0.065
Insulin function	91.71	93.63	0.146
Types of diabetes	88.88	89.17	0.832
Risk factors	82.16	90.44	0.500
Diabetes and heredity	95.54	96.17	0.581
Meeting 2: "Pathophysiology of Diabetes *Mellitus*" (n=130)			
Questions	**Pre-test (%)**	**Post-test (%)**	**p value***
Pancreas and insulin production	93.07	94.61	0.388
Diabetes and weight loss	70.76	92.30	**<0.001**
Diabetes and blindness	96.15	98.46	0.453
Diabetes and excessive thirst	92.30	98.46	**0.013**
Diabetes and foot infections	93.07	98.46	**0.016**

Meeting 3: "Feeding of the person with diabetes" (n=136)			
Questions	**Pre-test (%)**	**Post-test (%)**	**p value***
Fiber intake	91.91	94.85	0.607
Partition of meals	93.38	98.52	**0.039**
Intake of fats	80.88	78.30	0.154
Intake of roots and tubers	42.64	70.58	**<0.001**

* McNemar Test (5%)

With regard to the feedback, most of the participants considered the meeting "good" and "very good", with no differences among the themes approached (p>0.05). Additionally, particular attention is drawn to the fact that a high share of the participants (97.69% to 98.72%) found having learned something new, with no significant difference between the meetings.

Some comments and questions from the participants during the meetings referred to, above all, nutrition, signs and symptoms and the pathophysiology of diabetes (Chart 2).

Chart 2 – Main comments and questions from the participants. Belo Horizonte – MG, 2012-2013.

Meetings	Comments	Questions
Meeting 1 "What is Diabetes *Mellitus*" (n=167)	"Diabetes is sugar in blood." "Diabetes is when the pancreas stops working."	"When does hypoglycemia occur?" "What is the difference among the types of diabetes?" "Why is it important to control blood glucose?"
Meeting 2: "Pathophysiology of Diabetes *Mellitus*" (n=130)	"There are people with normal blood glucose, but their glycohemoglobin are altered." "When a person has diabetes, there are dry mouth, thirst and pees a lot." "Exercising helps control diabetes." "Diabetes causes blindness."	"What is the secret to grow old without diabetes?" "Why does a diabetic person have sores that are slow to heal?" "Why does the person with diabetes lose weight?"
Meeting 3: "Feeding of the person with diabetes" (n=136)	"Foods that grow under the earth cannot be consumed by people with diabetes." "Eating fibers is good for the people with diabetes." "A person who has diabetes must eat every 3 hours." "The diabetic person cannot eat dough in excess, because this increases blood glucose levels."	"Can accumulated blood sugar be because of eating habits?" "If the person eats a lot of candies, can h this person develop diabetes?" "Can I eat candies once in a while?"

Note: In the fourth meeting, the observer's evaluation was not registered because it was a review of the themes addressed in the previous meetings.

Three months after the end of intervention, 87 users were interviewed – 52.1% of the total participants of the meetings, being most of them (81.4%) women, median age of 66 (44-84) years, education of 9 (1-18) years and per capita income of BRL 600.00 (BRL 500.00-BRL 10,000.00). In relation to marital status, 62.7% (n=54) were married, 23.0% (n=20) were single, 10.3% (n=9) were widowed, and 4.0 (n=4) were divorced. When asked about health conditions, 10.3% (n=9) declared having DM.

Considering the general food habits, 57.5% (n=50) of the users mentioned removing apparent fat from meats before consumption, 47.1% (n=41) prepared chicken without its skin, 89.7% (n=78) prefer using vegetable oil to cook more frequently, and 48.3% (n=42) use sugar to sweeten beverages (Table 2).

As for changes in food habits, 25.3% (n=22) mentioned having increased the number of meals, an average of 4.00 ± 1.22 daily meals, 93.1% (n=81) increased intake of high-fiber foods and wholefoods, 83.9% (n=73) reported a decrease in the intake of oils and 72.4% (n=63) of sugars (Table 2). Moreover, as main benefits perceived after the intervention, 57.5% (n=50) reported having improved their feeding quality, 19.5% (n=17) stated their health improved, and 14.9% (n=13) noticed their knowledge about the aspects related to diabetes *mellitus* increased (Table 2).

Table 2 – Changes in diet and benefits reported by the users after attending the meetings. Belo Horizonte/MG, 2012-2013.

General food habits		**n (%)**
How do you deal with the meat fats?	It already comes with no fat	50 (57.5)
	I remove it sometimes	19 (21.8)
	I remove it most of the times, or I remove it before eating	08 (9.3)
	I never remove it	05 (5.7)
	I do not eat meat	05 (5.7)
How do you deal with the chicken skin?	It already comes with no fat	41 (47.4)
	I remove it sometimes	9 (10.3)
	I remove it most of the times, or I remove it before eating	33 (37.7)
	I never remove it	02 (2.3)
	I do not eat chicken	02 (2.3)
What type of fat do you use more often?	Vegetable oil	78 (89.7)
	Olive oil	07 (8.0)
	Animal fat or lard	02 (2.3)
What do you use to sweeten beverages?	Sugar	42 (45.3)
	Sweetener	38 (43.7)
	I do not use anything	7 (11.0)
Changes in food habits		**n (%)**
Daily meals	Increased	22 (25.3)
	Reduced	20 (23.0)
	No change	45 (51.7)
Increase in the intake of high-fiber foods and wholefoods		81 (93.1)
Reduction of consumption	Oil	73 (83.9)
	Sugar	63 (72.4)
Main reported benefits	Improved diet	50 (57.5)
	Improved health	17 (19.5)
	Increased knowledge	13 (14.9)
	Improved health and diet	10 (11.5)
	Helped lose weight	06 (6.9)
	Increased exercise	01 (1.1)

DISCUSSION

The use of the operative group strategy for food and nutrition education in diabetes in the Health Promotion Center provided the participants with the acquisition and improvement of knowledge about DM. Similarly, a study developed in 2010, with 32 users with

diabetes *mellitus* type 2 enrolled in the operative group educational program in three health centers in Belo Horizonte – MG, promoted increased knowledge about the disease[17].

Indeed, the refinement of the concepts addressed in group processes provide the participants with a new elaboration of information, in addition to allowing integration and promoting questioning about oneself and others. Learning is a continuous process in which interaction and communication are inseparable. And exactly because of the reciprocity of these interactions it is possible to share meanings, knowledge and values that, elaborated and internalized reflectively, may result in effective changes in lifestyle[18].

In this context, the improvement of food habits reported after the interventions, if those are long-lasting, may contribute substantially to the quality of life and reduction of the conditions related to DM. Obtaining new knowledge is associated to change in behavior[19]. It is worth highlighting that the changes in food habits (increase in fiber intake and decrease in intake of food high in sugar and fats) generate benefits to health and are vital for treatment, prevention and control of diabetes.

Soluble fibers act by decreasing glucose absorption rate, since those slow down gastric emptying as a result of adsorption and interaction with nutrients, thus providing a smaller contact surface with the small intestine wall, resulting in better postprandial blood glucose control[20]. In parallel, decreasing fat intake, in addition to preventing different degrees of glucose intolerance, may allow the control of parameters such as serum levels of total cholesterol, triglycerides, apolipoprotein B and HDL cholesterol, which are of vital importance to reduce the risk of vascular complications deriving from DM[21,22].

The benefits of acquiring diabetes-related knowledge can be viewed in other papers, in which users with better scores of knowledge have higher acceptance of the disease and higher adherence to metabolic control practices[23,24]. Likewise, a paper developed with users of a Health Academy Program in Belo Horizonte – MG, also based in the group approach, shows a significant increase in the knowledge about healthy food habits, reflecting in an improvement of food habits, such as consuming less fat, fried food, candies and sugars, and increase in the consumption of fruits and greens[25].

In addition to the nutritional benefits, it is worth to highlight the advantages inherent to the intervention strategy adopted, which allows fostering thought, creativity and exchange of experiences about the proposed task, which in this study was configured as the systematization of knowledge on diabetes[26]. Such benefits are confirmed by the high share of participants that evaluated the meetings positively and reported having learned something new from the contents approached.

Group experiences reflect on the personal life, once the reports about the experiences promote identification and chain reactions. Thus, a member serves as a support for the psychic processes of other members and of the group[18]. The group work, through the strategy by Pichón-Rivière, also enables the sense of *affiliation* and *belonging*, which is the degree of identification of the group members among themselves and with the task; *cooperation*, which presupposes mutual help and takes place through the performance of different roles and functions in the proposed group dynamics; and *tele*, pointed out as a transference network, in other words, the negative or positive availability of the group members to do joint work[11].

In this context, the operative groups have a therapeutic character, for they work as a space of listening, where the coordinator asks, discusses and problematizes the speeches to enable reflection by the members[26].

Finally, in face of the positive results, the importance of the operative groups is evident, being aimed at food and nutrition education in Health Care Services such as the Health Academy Program. Other highlights include the feasibility of continuing and replicating those activities in other services for complying with Ordinance #719, of 7 April 2011, which

includes the Health Academy Program in the scope of the Public Health System and rules that food and nutrition safety activities and food education should be developed at those places[12].

It should be mentioned that the profiles of the participants, mostly women, elders and with low education, are also observed in other studies with populations with DM in Primary Health Care[25.27.28], meaning the need for intervention in that type of population.

However, some limitations of this work should be highlighted, for those may have influenced the results, such as the high turnover and the absenteeism. Such circumstances prevented the attendance of the users at all meetings, which compromised the continuity of the activities. Moreover, the application of the final survey to all participants was not possible for the same reasons. Similar difficulties are found in intervention studies conducted in services with those characteristics[15.25].

Another issue is that the food habit changes were self-reported by the participants, being prone to memory bias. However, it is verified that studies and researches in the field of health use self-reporting as a way of evaluation[29,30]. Also, the users' eating habits were not investigated prior to the intervention, which compromised the comparison of the changes in habits at the end of the activities.

The absence of a control group can also be pointed out as a limitation of this study. Nonetheless, controlled interventions in health promotion services are scarce for practical and ethical reasons. Additionally, the health context of the population studied has external validity and can subsidize other interventions at the population level.

CONCLUSION

The execution of the operative group of food and nutritional education on diabetes at the Health Promotion Center, based on the theory of operative groups by Pichon-Rivière, was capable of providing the users with acquisition of knowledge related to the pathophysiology, feeding and signs and symptoms of diabetes *mellitus*.

As they acquired new information, the participants reported they were able to promote changes in food habits that are crucial for prevention, control and treatment of the disease. The need for maintaining groups of Food and Nutrition Education in Health Promotion Centers is reinforced so these promote long-term changes in food habits that are good for the population.

Individual contribution of the authors: LB Bedeschi worked on the study design, data analysis, drafting and critical review, and approval of the final version; RS Girundi worked on the study design, collection, analysis and interpretation of results, drafting of the paper and approval of the final version; RD Mendonça worked on data interpretation, critical review and approval of the final version; ACS Lopes worked on the study design, data interpretation, critical review and approval of the final version; and LC Santos worked on the study design, critical review and approval of the final version of the paper.

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