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Impact of educational group strategy to improve clinical and glycemic parameters in individuals with diabetes and hypertension

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Impact of educational group strategy to improve clinical and glycemic parameters in individuals with diabetes and hypertension

Objective. To evaluate the impact of an educational group strategy to improve clinical and glycemic parameters in individuals with diabetes and hypertension. **Methods.** This descriptive prospective study included 172 individuals living in São José do Rio Preto-SP, Brazil, who were enrolled in a well-integrated educational group called HIPERDIA (Record System for Follow-up of Hypertensive and Diabetic Individuals) coordinated by a qualified multidisciplinary team. We

analyzed sociodemographic, anthropometric, clinical, and laboratory data. Data were collected in the first, fifth, and eighth meeting of the educational group. **Results.** A total of 68.6% of patients were women, 85.4% were white, 64.0% had an incomplete basic education, 47.7% were retired, 79.7% had been diagnosed with diabetes for 6 or more years, 9.9% were smokers, and 9.9% used alcohol. Individuals' diastolic blood pressure decreased between the fifth and eighth meeting ($p < 0.05$). Between the first and fifth meeting, both fasting glucose levels ($p < 0.05$) and glycated hemoglobin decreased; the latter continued to drop at the fifth and eighth meetings ($p < 0.001$). Anthropometric parameters remained unchanged.

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Conclusion. The results suggest that an educational group strategy is favorable for controlling diabetes mellitus and hypertension.

Key words: diabetes mellitus; health promotion; health education; hypertension.

Impacto de la estrategia de grupo educativo en el mejoramiento de parámetros clínicos y glicémicos de diabéticos e hipertensos

Objetivo. Evaluar el impacto de la estrategia de grupo educativo en el mejoramiento de parámetros clínicos y glicémicos de personas diabéticas e hipertensas.

Métodos. Estudio descriptivo prospectivo realizado con 172 personas residentes en São José do Rio Preto-SP, Brasil, participantes de los grupos educativos de HIPERDIA (Sistema de Gestión Clínica de HIPERTensión Arterial y DIAbetes Mellitus en Atención Básica) coordinados por un equipo multidisciplinar cualificado y bien integrado. Se analizaron variables sociodemográficas, antropométricas, clínicas y de laboratorio recolectadas durante la primera, quinta y la octava reunión de los grupos educativos del programa. **Resultados.** Las características generales de los participantes fueron: 68.6%, mujeres; 85.4%, blancos; el 64.0% no había completado la educación primaria; el 47.7% estaba jubilado; el 79.7% había sido diagnosticado con diabetes hacía 6 años y más; el 9.9% era fumador e igual porcentaje bebía alcohol. La presión arterial diastólica disminuyó entre la quinta y la octava reunión ($p<0.05$). Entre la primera y la quinta reunión disminuyeron los niveles de glucosa en ayunas ($p<0.05$) y de hemoglobina glucosilada ($p<0.001$); esta última continuó reduciéndose de la quinta a la octava reunión ($p<0.001$). Los parámetros antropométricos permanecieron sin cambios.

Conclusión. La importancia de los hallazgos sugiere que la estrategia de utilizar grupos educativos tiene

efecto favorable para el control de la diabetes mellitus y de la hipertensión arterial.

Palavras chave: diabetes mellitus; promoção de la salud; educación en salud; hipertensión.

Impacto da estratégia de grupo educativo no melhoramento de parâmetros clínicos e glicêmicos de diabéticos e hipertensos

Objetivo. Avaliar o impacto da estratégia de grupo educativo no melhoramento de parâmetros clínicos e glicêmicos de diabéticos e hipertensos. **Métodos.** Estudo descritivo prospectivo realizado com 172 pessoas residentes em São José do Rio Preto - SP, Brasil, participantes dos grupos educativos de HIPERDIA (Sistema de gestão clínica de Hipertensão Arterial e Diabetes Mellitus em atenção básica) coordenados por uma equipe multidisciplinar qualificada e bem integrada. Foram analisadas variáveis sócio-demográficas, antropométricas, clínicas e laboratoriais que foram coletadas na primeira, quinta e oitava reuniões dos grupos educativos do programa. **Resultados.** As características gerais dos participantes foram: 68.6% eram mulheres, 85.4% eram brancos, 64.0% não haviam completado o ensino fundamental, 47.7% eram aposentados, 79.7% tinham sido diagnosticados com diabetes fazia seis anos ou mais, 9.9% eram fumantes e igual porcentagem ingeriam álcool. A pressão arterial diastólica diminuiu entre a quinta e a oitava reunião ($p<0.05$). Entre a primeira e a quinta reunião diminuíram os níveis de glicose em jejum ($p<0.05$) e hemoglobina glicosilada ($p<0.001$); esta última continuou a cair da quinta a oitava reunião ($p<0.001$). Os parâmetros antropométricos permaneceram inalterados. **Conclusão.** A importância dos resultados sugerem que a estratégia de utilizar grupos educativos têm efeito favorável para o controle da diabetes mellitus e da hipertensão.

Palavras chave: diabetes mellitus; promoção da saúde; educação em saúde; hipertensão.

Introduction

Diabetes mellitus (DM) and hypertension are important noncommunicable chronic diseases (NCCD) worldwide given their epidemic proportions and the high financial and social costs

of control and treatment of their complications.¹ Almost 382 million people are living with DM, which kills one person every 6 seconds,² and hypertension is responsible for 25% of deaths due to coronary artery disease. The hypertension

associated with DM contributes to 50% of end-stage kidney disease.³ These alarming data are mainly due to obesity, sedentary lifestyle, and population aging, which currently are more common in developed countries but are now increasing in developing country.²

Currently, the health care model is not prepared to delivery integrated assistance for those with NCCD in order to promote and perform team actions, stimulate self-care of these individuals and ensure their co-responsibility for treatment, and change lifestyle.⁴ In this sense, group educational actions are important when there is active participation of a multidisciplinary team and users who must be motivated to acquire new knowledge of the disease and adopt new behavior.⁵ For this reason, primary healthcare (PHC), which is proposed to break with the biomedical model and invest in building new practices based on integrated care in a humanized and committed manner,⁶ should be prepared for the challenge of caring for patients with NCCD. This involves an investment in the healthcare team, especially nurses, who are important mediators in educational activities because they are the professionals trained for this task. They also have an important role because of the characteristics of their training, which includes management of care practices; organization of healthcare processes; and promotion of individual, family, and community healthcare. This study sought to analyze glycemic, anthropometric and clinical parameters in individuals with DM and hypertension who participated in educational group activities.

Methods

This prospective, descriptive and quantitative study was carried out from March 2012 to May 2014 at the traditional basic health unit (BHU) of the public service network of the municipality of São José do Rio Preto-S, Brazil. This BHU has a healthcare agent to follow up families and the priorities of the area, along with actions for vector control, in order to adhere to the work of the Family Health Strategy. This BHU uses a

multidisciplinary team, which is responsible for developing health promotion actions (e.g., an educational group of hypertensive and diabetic individuals).

This study included diabetic and hypertensive patients aged 18 or older who were enrolled in the Record System for Follow-up of Hypertensive and Diabetic Individuals (HIPERDIA [acronym in Portuguese]). This system was implemented by the Brazilian Ministry of Health. To participate in the study, patients must have had attended at least 75% of educational group sessions and have agreed with the study procedures. Those who agreed to be part of the study signed the consent form. We also considered record of glycated hemoglobin levels (HbA1c) between the beginning of the educational group meetings and at least 6 months before the group meetings began.⁷

Exclusion criteria were age younger than 18 years, attendance at fewer than 75% of the educational group meetings, refusal to participate, change in mailing address, death, and not undergoing the exams. Of 184 patients from the educational groups, 172 completed the study: 2 died (of renal failure and stroke), 2 requested to leave the study, 2 moved to another health unit, and 5 did not perform one or two exams. Data were collected from notes from the medical record on the following variables: sociodemographic data, such as formal education (years of formal education), work status, sex, age, race/ethnicity, marital status; life habits (such as use of alcohol and tobacco products); clinical data (systolic blood pressure [SBP] and diastolic blood pressure [DBP]), anthropometric data (weight, height, waist circumference, body mass index [BMI]) and laboratory data (fasting glucose and HbA1c) according to criteria of the Brazilian Society of Diabetes (BSD).⁷ Clinical variables and anthropometric and laboratory data were analyzed in the 1st, 5th and 8th group meeting.

The educational group was planned and executed according to local conditions of service by a multidisciplinary health team (physicians, nurses, nutritionists, psychologists, pharmacist,

physiotherapist and hearing-speech-and-language therapist), after training in specific areas. The pedagogic posture adopted was the dialogic model because it enabled active participation of the participant in his or her own learning process.⁸ During medical consultations, we invited hypertensive and diabetic individuals enrolled in the HIPERDIA of the BHU to participate in the group. We conducted eight meetings every 3 months, each lasting one hour and 30 minutes. In the first 30 minutes of the meeting we measured patients' anthropometric, clinical and laboratory variables; in the remaining hour, an educational action was promoted. After each group meeting, participants were then referred for individual medical consultation with internal physicians of the unit.

Every week the multidisciplinary team, including physician, nurse, social assistant, nutritionist, hearing-speech-and-language therapist, psychologist, and physiotherapists, attended a meeting to discuss activities performed, plan new activities and train professionals. The topics covered included integration, diabetes and hypertension (basic concepts and physiopathology), dyslipidemia, health nutrition, physical activity (exercise), mental and emotional health, rational use of medications, and evaluation of educational process.

Data collected were entered into an Excel spreadsheet. The descriptive analysis of quantitative variables was carried out using measurement of central tendency and dispersion. Categorical variables were described from frequencies. The inferential statistical analysis, aiming to compare variables obtained at the first, fifth, and eighth meeting, was carried out after application of the Kolmogorov-Smirnov normality test and Levene test. After that, we used the Friedman test, in which we compared non-

parametrical dependent variables. In significant comparisons we applied the Dunn test. All comparisons adopted a significance level of 5%. We used Prisma software for statistical analyses.

This study was submitted to the ethical research committee of the São José do Rio Preto Medical School according to resolution 466/12 and approved according to the statement n.306.358; CAAE nº 17367013.1.0000.5415 from June 17, 2013.

Results

The analysis of sociodemographic variables in Table 1 shows that 68.6% of patients were women, 85.4% were white, 64.0% had an incomplete basic education, 47.7% were retired, 65.0% had been diagnosed with diabetes for 6 to 20 years, 90.1% were smokers and 90.1% used alcohol.

Clinical and glycemic parameters during two years of follow-up are described in Tables 2 and 3. SBP showed significant statistical results when applied in the Friedman test. However, the application of the Dunn post hoc test did not show significance in comparisons of groups two by two (first vs. fifth, first vs. eighth, and fifth vs. eighth meetings). We did not observe significant changes in weight, waist circumference and body mass index. Table 3 shows significant differences in DBP in the fifth and eighth meetings, in fasting glucose in the first and fifth meetings, and HbA1c from the first and fifth to the fifth and eighth meetings; however, no significant differences were seen when we analyzed variables between the first and eighth meetings. HbA1c levels decreased 0.8% from the first to the fifth meetings and 0.3% from the first to the eighth meetings.

Table 1. Individuals with diabetes and hypertension according to sociodemographic variables, habits and time of diabetes diagnosis. São José do Rio Preto-SP, 2012 to 2014 (n=172)

Variables	n	%
Sex		
Female	118	68.6
Male	54	31.4
Ethnicity		
White	147	85.4
Black	13	7.5
Asian	6	3.5
Parda	6	3.5
Level of formal education		
No formal education	10	5.8
Complete basic education	16	9.3
Incomplete basic education	110	64.0
Complete middle school	20	11.6
Incomplete middle school	3	1.7
Complete college education	10	5.8
Incomplete college education	2	1.1
Graduate	1	0.6
Position		
Public employee	1	0.6
Private employee	18	10.4
Freelancer	21	12.2
Student	1	0.6
Household activities	31	18.0
Retiree	82	47.7
Unemployed	2	1.1
Other	16	9.3
Smoker		
No	155	90.1
Yes	17	9.9
Use of alcohol		
No	155	90.1
Yes	17	9.9
Time of diabetes diagnosis		
< 5 years	35	20.3
6 – 10 years	50	29.0
11 – 20 years	62	36.0
21 – 29 years	13	7.6
More than 30 years	12	7.0

Table 2. Mean, standard deviation and median of quantitative variables, São José do Rio Preto-SP, 2012 to 2014

Variables	First meeting		Fifth meeting		Eighth meeting	
	Mean \pm SD	Median	Mean \pm SD	Median	Mean \pm SD	Median
Waist circumference	101.7 \pm 11.8	101	101.8 \pm 11.9	102	102.1 \pm 11.9	102
Weight	75.5 \pm 16.0	74	75.3 \pm 16.2	74	75.1 \pm 17.0	74
Body mass index	29.9 \pm 5.1	29.5	29.8 \pm 5.1	29.4	29.8 \pm 5.2	29.5
Systolic blood pressure	140.6 \pm 19.6	140	136.8 \pm 18.1	130	139.7 \pm 19.2	140
Diastolic blood pressure	83.0 \pm 12.2	80	82.0 \pm 10.2	80	85.2 \pm 9.5	80
Glycated hemoglobin	8.4 \pm 6.7	7.6	7.6 \pm 1.8	7.35	8.1 \pm 1.9	7.85
Fasting glucose	151.9 \pm 61.1	135	143.8 \pm 56.0	131.5	145.8 \pm 59.6	133

Table 3. Comparison between first, fifth, and eighth educational meetings according to clinical and laboratory variables, São José do Rio Preto, 2012 to 2014

Meetings	<i>p</i> * (first vs. fifth meeting)	<i>p</i> (fifth vs. eighth meeting)	<i>p</i> (first vs. eighth meeting)
Systolic blood pressure	>0.05	>0.05	>0.05
Diastolic blood pressure	>0.05	<0.05	>0.05
Glycated hemoglobin	<0.001	<0.001	>0.05
Fasting glucose	<0.05	>0.05	>0.05

(*)*p* value of Dunn's post hoc

Discussion

There are few studies of educational groups in clinical practice that aim to evaluate such programs for DM and hypertension control despite the importance and benefit of educational interventions for control of these diseases.^{9,10} A systematic review in the literature of studies published from 2008 to 2013 identified only 12 studies about the effectiveness of educational programs for DM and hypertension control. Results of our study showed that participants in educational groups had improvement in HbA1c, SBP and DBP. However, such a result was not observed in anthropometric measures, such as BMI, waist circumference and weight. To reduce glycemic and clinical rates, it is extremely important to control these problems, considering

that a 1% reduction in HbA1c corresponds to an approximately 25% to 30% reduction in chronic complications;^{11,12} however, it is also important to invest in anthropometric parameters given that sedentary lifestyle and obesity contribute to complications and worsening in elderly patients' quality of life.¹³

To stimulate adoption of healthy practices with positive inference in these diseases and consequently improve quality of life requires a specific and structured educational model to promote health for individuals with DM and hypertension, mainly when incorporated into the practical field of PHC.^{11,14,15} In this context, the municipality offers the following for population assisted at the BHA of the study: outdoor fitness areas (gyms for all ages) and other educational

groups (such as a spine school, school for nutrition re-education and Lian Gong practice). Those with NCCD, such as DM and hypertension, have difficulty adhering to the therapeutic regimen because of the complexity of their clinical picture and lack of knowledge of health professionals about the benefits of these therapies for this population.^{10,15} It is important to highlight that socioeconomic and cultural transformations and changes in lifestyle may interfere in pharmacological and non-pharmacological treatment.

Non-medication therapy may be more difficult because it involves reducing weight through physical exercise, a balanced diet, restricted use of alcohol and tobacco and control of lipids. Scientific evidence shows that adherence to non-pharmacological treatment is low and that less than 30% of patients change their lifestyle habits. To institute these changes, it is important to involve health professionals through the use of educational programs and to evaluate them periodically to assess for new realities.^{3,16} The increase in the prevalence of DM and hypertension aligns with the needs for treating a complex disease through diet restriction, use of medicines and associated chronic complications (retinopathy, nephropathy, neuropathy, cardiomyopathy, neuropathic foot, among others) and reinforces the importance of an efficient and viable educational programs to public health services.¹⁷ In this sense, if there trained health professionals interact and provide integrated services for care protocols for educational groups, including medical prescription for pharmacological and non-pharmacological treatment (such as physical activity with follow-up, monitoring, and supervision of team), could that produce better results?

Regarding this aspect, the health education effect has limited duration; its impact is reduced as time goes by, which requires periodic re-interventions.¹¹ In addition, it is important to maintain a professional relationship with the patients and to reassess the needs and profile of the educational group).¹⁸ The PHC presents a strategy that has a focus because it enables

longitudinal care, thereby assuring continuity of care to individuals with NCCD, and promotes integrated care and assessment of applied actions to individuals requiring professional follow-up of not only disease episodes but also of conditioning health factors through actions that promote and prevent by reducing risk factors.^{19,20}

The working process in health promotion of those with NCCD requires group educational activities, permanent groups of health teams that work with this population by discussing and defining strategies to prevent and control risk factors, problem resolution, nutrition and lifestyle habits, and use of alcohol and tobacco products, among others.³ To make the group activities in PHC services feasible involves changes in the focus of work process of exclusively individualized care to a collective health approach. In other words, to achieve the proposals of the PHC, services should not be limited to consultation appointment, emergency room service, and references for more complex services. Professionals must be trained to promote health by using educational strategies that encourage a change in knowledge based on a co-responsibility for health by the team and patient as they construct new pathways for a more healthy life. In this sense, a free practice is fundamental instead of an authoritative and coercive practice. This means that the health team must acknowledge and respond to the knowledge of individuals and not simply impose norms and behaviors according to technical knowledge.²¹

Therefore, health education is the main strategy for promotion when performed by the integrative multidisciplinary team because it stimulates self-care and adoption of healthy measures for disease control in a co-responsible way. Therefore, it requires empathy, communication and ability to work as a team.^{4,20} The PHC services are not well-prepared for this perspective of team work because of the absence of trained professionals to deal with this new strategy. For this to occur, the care model should undergo some reforms in its structure, such as improvement in communication among health teams, not only concerning care, but also concerning attribution of each member

of the team related to training and meeting to discuss problems and share decision making.²² In the municipality where this study was conducted, we highlight aspects that interfere in effective educational actions: prioritization of acute conditions above chronic situations, turnover among health professional that may cause problems in maintaining qualified health teams to deal with NCCD, attachment and difficulty finding the time for permanent education.²³

Turnover of professionals has been seen even more in public services, which causes problems with follow-up and coordination of care for individuals with NCCD; this in turn may create barriers to access, delays in diagnosis and treatment, and difficulty establishing the professional-patient-team relationship.^{24,25} In this study, for educational group activities we used as the strategy the problematizing education or dialogic model, which takes knowledge as a transforming tool from the education process; dialogue was the essential instrument for this transformation and always took into consideration the knowledge, perception and needs of users.²⁰

Although this method was used, because of the difficulties already discussed, the meetings were held only in rooms available at the BHU and did not entail longitudinal care. This may explain results showing less effectiveness concerning anthropometric parameters and may explain the lack of support for clinical and laboratory results of the fifth and eighth meetings. Therefore, health education can be effective, but it must provide conditions for the individual to be able, by him/herself, to critically analyze the problem and make decisions that may change these situations. The health team must be considered the support tool for planning and maintaining self-care, and this highlights the importance of nursing professionals as the main bridge for health team, user, family and community.

This study is limited by the lack of care protocols and diversity of medical management, which may include errors in notes for clinical and anthropometric parameters and thus may

influence the number of participants. On the basis of the significance of results, we suggest that an educational group strategy followed by longitudinal follow-up with a trained and integrated multidisciplinary team can promote favorable results for control of DM and hypertension.

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