

EDUCATIONAL INTERVENTION IN THE WORKPLACE: CARDIOVASCULAR HEALTH PROMOTION AND PREVENTION WITH METALLURGICAL MEN

INTERVENÇÃO EDUCATIVA NO LOCAL DE TRABALHO: PROMOÇÃO DA SAÚDE E PREVENÇÃO CARDIOVASCULAR COM HOMENS METALÚRGICOS

INTERVENCIÓN EDUCATIVA EN EL LUGAR DE TRABAJO: PROMOCIÓN DE LA SALUD Y PREVENCIÓN CARDIOVASCULAR CON HOMBRES METALÚRGICOS

Sonia Silva Marcon¹
Gabriela Schiavon Ganassin²
Guilherme Oliveira de Arruda³
Elen Ferraz Teston⁴
Mayckel da Silva Barreto⁵
Verônica Francisqueti Marquete⁶
Patrícia Chatalov Ferreira⁷

How to cite this article: Marcon SS, Ganassin GS, Arruda GO, Teston EF, Barreto MS, Marquete VF, et al. Educational intervention in the workplace: cardiovascular health promotion and prevention with metallurgical men. *Rev baiana enferm.* 2021;35:e38619.

Objective: to analyze the effects of educational intervention on cardiovascular risk factors of metallurgical men. **Method:** intervention study, with evaluation before and after, carried out with workers of metallurgical industry in inland Paraná. Data were collected between March and June 2014 in weekly meetings, during lunch break time, following the operative group's molds. The study was started with 135 men (67 in the intervention group and 68 in the control group) and concluded with 72 (35 and 37, respectively). **Results:** among the participants of the intervention group, a significant decrease in risk behaviors for cardiovascular health (sedentary lifestyle, excessive alcohol consumption, use of industrialized spices and inadequate eating habits) and reduction of diastolic blood pressure and weight were observed. **Conclusion:** interventions in the work environment are an important strategy for reaching the male audience, besides being effective in promoting lifestyle-related changes.

Descriptors: Healthy Lifestyle. Nursing. Health Education. Cardiovascular Disease. Risk Factors.

¹ Nurse. PhD in Nursing Philosophy. Professor of the Nursing Graduation and Post-Graduation at the Universidade Estadual de Maringá. Maringá, Paraná, Brazil. soniasilva.marcon@gmail.com. <http://orcid.org/0000-0002-6607-362X>.

² Nurse. MSc in Nursing. Nurse at the Tower Health Chestnut Hill Hospital. Philadelphia, Pensilvânia, Estados Unidos. <http://orcid.org/0000-0002-1345-5026>.

³ Nurse. PhD in Nursing. Professor of the Nursing Graduation and Post-Graduation at the Universidade Federal de Mato Grosso do Sul. Campo Grande, Mato Grosso do Sul, Brazil. <http://orcid.org/0000-0003-1690-4808>.

⁴ Nurse. PhD in Nursing. Professor of the Nursing Graduation and Post-Graduation at the Universidade Federal de Mato Grosso do Sul. Campo Grande, Mato Grosso do Sul, Brazil. <http://orcid.org/0000-0001-6835-0574>.

⁵ Nurse. PhD in Nursing. Coordinator of the Nursing Course at the Faculdade de Filosofia, Ciências e Letras de Mandaguari. Mandaguari, Paraná, Brazil. <http://orcid.org/0000-0003-2290-8418>.

⁶ Nurse. MSc in Nursing. Universidade Estadual de Maringá. Maringá, Paraná, Brazil. <http://orcid.org/0000-0002-8070-6091>.

⁷ Nurse. Specialist in Emergency Nursing. Universidade Estadual de Maringá. Maringá, Paraná, Brazil. <http://orcid.org/0000-0001-9409-5888>.

Objetivo: analisar os efeitos de intervenção educativa nos fatores de risco cardiovasculares de homens metalúrgicos. Método: estudo de intervenção, com avaliação antes e depois, realizado com trabalhadores de indústria metalúrgica no interior do Paraná. Os dados foram coletados entre março e junho de 2014 em encontros semanais, no horário de descanso do almoço, seguindo os moldes do grupo operativo. O estudo foi iniciado com 135 homens (67 no grupo intervenção e 68 no controle) e concluído com 72 (35 e 37 respectivamente). Resultados: entre os participantes do grupo intervenção foi observado diminuição significativa de comportamentos de risco para saúde cardiovascular (sedentarismo, consumo excessivo de álcool, uso de temperos industrializados e hábitos alimentares inadequados) e redução da pressão arterial diastólica e do peso. Conclusão: intervenções no ambiente de trabalho constituem importante estratégia para o alcance do público masculino, além de serem efetivas na promoção de mudanças relacionadas ao estilo de vida.

Descritores: Estilo de Vida Saudável. Enfermagem. Educação em Saúde. Doenças Cardiovasculares. Fatores de Risco.

Objetivo: analizar los efectos de la intervención educativa en los factores de riesgo cardiovascular de los hombres metalúrgicos. Método: estudio de intervención, con evaluación antes y después, realizado con trabajadores de la industria metalúrgica en el interior de Paraná. Los datos fueron recogidos entre marzo y junio de 2014 en reuniones semanales, durante la hora de descanso del almuerzo, de acuerdo con los moldes del grupo operativo. El estudio se inició con 135 hombres (67 en el grupo de intervención y 68 en el grupo de control) y concluyó con 72 (35 y 37, respectivamente). Resultados: entre los participantes del grupo de intervención, se observó una disminución significativa en las conductas de riesgo para la salud cardiovascular (estilo de vida sedentario, consumo excesivo de alcohol, uso de condimentos industrializados y hábitos alimenticios inadecuados) y reducción de la presión arterial diastólica y el peso. Conclusión: las intervenciones en el entorno de trabajo son una estrategia importante para llegar al público masculino, además de ser eficaces en la promoción de cambios relacionados con el estilo de vida.

Descriptorios: Estilo de Vida Saludable. Enfermería. Educación para la Salud. Enfermedad Cardiovascular. Factores de Riesgo.

Introduction

Since 2005, cardiovascular diseases (CVD) are the main causes of death in the world and in Brazil and are mainly represented by ischemic heart disease⁽¹⁾. In 2016, about 17.9 million people worldwide died from CVD (31% of all global deaths). It is worth noting that over 75% of deaths from this cause occur in low- and middle-income countries⁽²⁾. The report "Cardiovascular Statistics - Brazil 2020" presents an overview, with comprehensive national data on heart disease and stroke, in which it is observed that the disease has a similar pattern in all regions of the country⁽³⁾. Specifically in the state of Paraná, in 2015, CVD occupied the first place of the causes of death and caused 95,763 hospitalizations, with a mortality rate of 182.4 /100,000 inhabitants⁽¹⁾.

Studies indicate an association between CVD and increased mortality in workers, especially due to greater exposure to environmental and stressor factors, when compared to the general population⁽⁴⁻⁵⁾. It is noteworthy that in men high systolic blood pressure is the second largest

contributor to morbidity and mortality and disability, followed by dietary risks and high Body Mass Index (BMI)⁽⁶⁾.

In Brazil, the male population stands out for adopting unhealthy habits, such as smoking, diets with low consumption of fruits and vegetables, higher consumption of soft drinks, ultra-processed foods, marked consumption of alcoholic beverages, besides prevailing overweight⁽⁷⁾. It is noteworthy that those factors contribute to the increased premature morbidity and mortality in men⁽⁴⁾, which constitutes a reality in different regions of the country and the world, besides being a public health problem⁽⁸⁾.

Concerning health promotion and disease prevention, it is noteworthy that educational actions specifically aimed at the male population have been shown to be efficient⁽⁹⁻¹⁰⁾, resulting in increased demand for primary care services⁽¹¹⁾. Those actions, therefore, are of great value, especially when using differentiated strategies to address risk factors and behaviors, which are mostly modifiable. However, the implementation

of those actions with the male population is a challenge⁽¹²⁾, because, in addition to adopting unhealthy behaviors^(6,13-14), they seek very little primary care health services and there is still the stereotype established by society that they are strong and invulnerable beings⁽⁸⁾. Those obstacles favor the appearance of CVD in males⁽¹³⁾, and are one of the main causes of death in this group.

Therefore, although health interventions need to be organized in a way that is clinically more appropriate and more effective from a financial point of view⁽¹⁴⁾, they are essential to promote and maintain changes in the individuals' life habits⁽⁹⁾, and can even be expanded beyond the biomedical view, as they allow the critical-participatory approach seeking self-care and empowerment of the subject^(9,15-16). In this sense, there stands out the challenge to create accessible intervention approaches that lead to sustainable changes in lifestyle, especially of men, and especially considering the particularities of this population in relation to demand and access to health services⁽⁹⁾.

It is noteworthy that, in the national scenario, men's health has been a focus of interest of health professionals and researchers, who have gradually made efforts to cope with the problems involved and identify specific and more effective approaches in the approximation with this population, at different times and contexts. It is important to highlight that this challenge gains special prominence in the current scenario of the COVID-19 pandemic.

Intervention studies aimed at the prevention of CVD addressing workers or the population in general are still infrequent in the Brazilian scenario, especially among industrial workers. It is worth mentioning that this public constitutes a specific class of workers, who are often subject to a differentiated work routine⁽¹⁷⁾. Moreover, among men, it is common to prioritize work to the detriment of health prevention/promotion actions. This, in turn, acts as a determining element for non-adherence to self-care and for the occurrence of risk factors for illness⁽¹⁸⁾. In this context, implementing and evaluating educational interventions in the work space can

enable the proposition of timely and effective actions for this population.

Thus, the aim of this study was to analyze the effects of educational intervention on cardiovascular risk factors of metallurgical workers.

Method

Intervention study carried out in the headquarters of a metallurgical-mechanical company located in the metropolitan region of the municipality of Maringá, Paraná, which has three branches in the states of São Paulo, Mato Grosso do Sul and Goiás. The choice of the company was by convenience due to the researcher's personal relationships that facilitated access to and development of the study.

The aforementioned company started its activities in 1986 and operates in the manufacture of equipment for the sugar and alcohol sector, vehicular cranes, road equipment and cargo handling. It is emphasized that during the study many workers were disconnected from the company, since their activities are related to the agricultural harvest.

Male workers who met the following inclusion criteria participated in the study: working in the company at the beginning of data collection, regardless of time of activity, and being 18 years of age or older. Workers on sick leave or vacation were excluded.

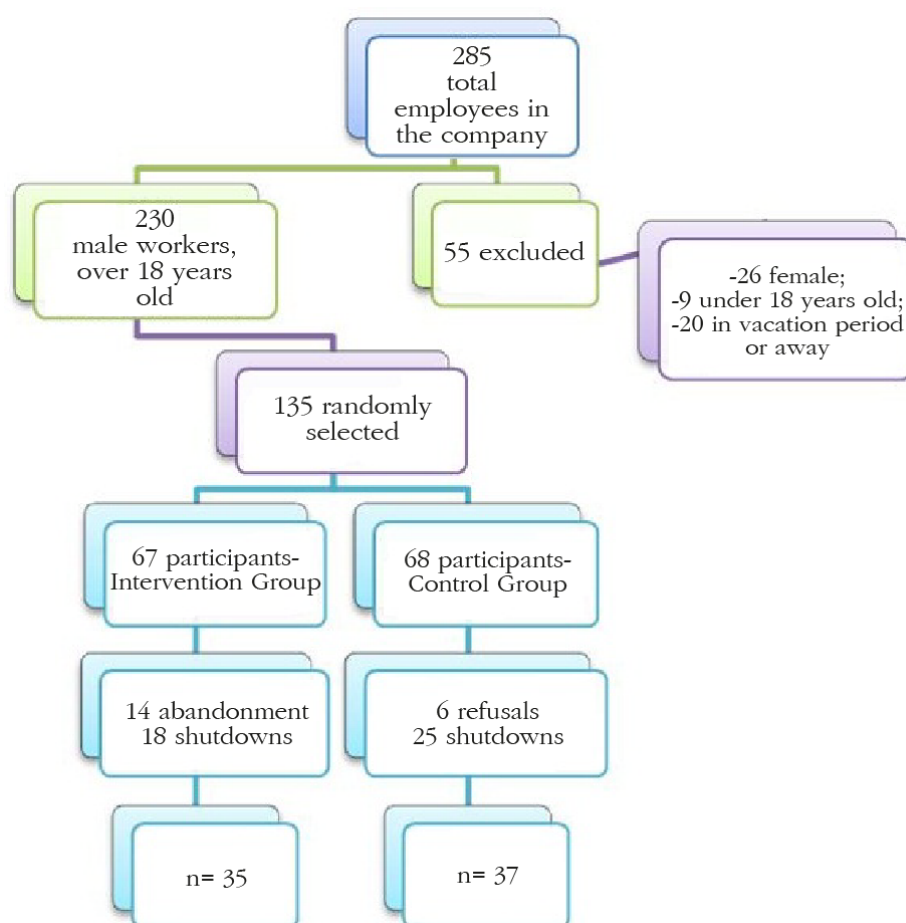
According to the list provided by the company, 230 male workers met the inclusion and exclusion criteria and all participated in the first stage of the study, which was intended to verify knowledge about CVD risk. On this occasion, they were informed that there would be a second stage of the study and that those who were drawn for this phase would receive a statement on their point card informing the day and time they should attend the room used for data collection.

To define the number of workers who would participate in the intervention, the total of the eligible(230) was considered, estimation error of 1%, reliability and accuracy of the sample of

95%, and expected prevalence of 50%, resulting in 135 individuals, who were randomly selected in two stages in the Microsoft Excel[®] program. In the first stage, there was the draw of those who would be part of the study and, in the second, who would be allocated in the intervention group (n=67) and in the control group (n=68). To this end, the list with the names of the 230 workers was placed alphabetically and sequential numbers were assigned. The same process occurred with the 135 randomized,

with a ratio between the groups of 1:1, with 67 participants in the intervention group (n=67) and 68 in the control group (Figure 1)⁽¹⁹⁾. All the individuals drawn agreed to participate in the study, with no need for substitutions for the composition of the groups. It is noteworthy that after randomization and interventions were attributed to each group, the researchers and participants knew the composition and definition of the experimental groups.

Figure 1 – Flowchart of selection of the participants



Source: Created by the authors.

Data were collected from March to June 2014 in two moments – before and after the educational intervention –, through the application of a semi-structured instrument and verification of anthropometric data. The instrument used addressed sociodemographic, anthropometric, clinical characteristics (capillary

glycaemia, systolic blood pressure (SBP) and diastolic blood pressure (DBP), and questions about Cardiovascular risk factors, smoking, excessive alcohol consumption, eating habits and physical activity, extracted from validated instruments, because they allow the evaluation of health behavior^(7,13).

All workers allocated in the intervention group were invited to participate in a health education program, developed along the lines of operative groups⁽²⁰⁾, having as theoretical reference the Chronic Conditions Care Model (CCCM), which proposes to carry out care actions directed to the general population, individuals with risk behaviors and factors, as well as those who already have pre-existing disease, with a view to reducing complications⁽²¹⁾.

The assumptions related to levels 1 and 2 of the CCCM were adopted more specifically. Level 1 focuses on the general population and includes health promotion actions, through the implementation of intersectoral projects focused on health social determinants, such as living and working conditions and access to services. Level 2 incorporates the prevention of health conditions in specific subpopulations, through interventions on health social determinants, i.e., modifiable risk factors – those related to behaviors and lifestyle. They are: inadequate diet, overweight, physical inactivity, smoking and excessive alcohol use⁽²¹⁾.

The individuals of the intervention group were subdivided into four subgroups, because, according to the principles of the operative group⁽²⁰⁾, the number of participants should ensure the visualization of all and, at the same time, allow everyone to manifest themselves. For three months, the groups met weekly. The meetings lasted approximately 50 minutes and were held shortly after lunch, during the rest period, in a room provided by the company. They were conducted, recorded and mediated by the researcher herself, assisted by a nurse, who participated as an observer, recording nonverbal behaviors and helping to verify blood pressure, weight and capillary glycaemia performed at the beginning and/or at the end of each meeting⁽¹⁹⁾.

The meetings involved three moments: embracement – verification of vital signs and conversation wheel with space for reporting and exchanging experiences, focusing on the difficulties and achievements of the last week; approach of the theme of the day through dialogued exposure, preceded by the survey of previous knowledge;

closing – with clarification of doubts and joint definition of tasks to be performed during the week and the goals to be achieved by the group in its entirety or by some participants.

The topics addressed were defined previously and together with the participants in the first meeting, and included: hypertension, diabetes, cerebrovascular accident, infarction, prostate cancer, healthy eating, physical activity, posture at work, cholesterol, smoking and alcohol consumption, overweight and obesity⁽¹⁹⁾. Over the three months, some health professionals were invited by the researcher to address specific aspects of their area of activity in the four subgroups of the intervention. They were: nutritionist, physiotherapist, endocrinologist, physical educator and nurses.

The 68 workers who were part of the control group had their blood pressure measured whenever requested and the main researcher made a commitment to carry out educational activities after the end of data collection, which occurred in August and September of the same year, through three lectures open to all workers, including females.

The post-intervention evaluation was performed one week after the end of the educational activities, when all the instruments used in the first stage were applied again. However, for this study, only the variables related to cardiovascular risk factors/behaviors, dichotomized at normal risk or increased risk, according to research standards of the Surveillance System of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigitel)⁽³⁾ were considered.

The increased risk was identified when the following occurred:

a) abusive consumption of alcoholic beverages (yes/no) - five or more drinks at the same time (one dose of distilled drink, a can of beer or a glass of wine);

b) current smoking habit (yes/no), regardless of the number of cigarettes per day current smoking habit (yes/no), regardless of the number of cigarettes per day;

c) failure to perform any type of physical activity for at least 50 minutes three or more times a week, which together reach a time equal to or greater than 150 minutes of physical activity during the week (yes/no);

d) inadequate food consumption when fried foods, cakes, cookies and sweets were eaten four or more days a week or when fruits and vegetables were eaten four or less days a week.

For blood pressure assessment, measured after three to five minutes of rest, using standard method, the parameters considered were: normal SBP <130 mmHg, borderline of 130-139 mmHg and high \geq 140 mmHg; normal DBP < 85 mmHg, borderline of 85-89 mmHg and high \geq 90 mmHg. However, for statistical purposes, the values identified as borderline or high were classified as high.

Other parameters considered normal were: postprandial capillary glycaemia – measured with G-Tech Free1[®] one hour after lunch – when \leq 160 mg/dl; Percentage of Body Fat (PCG) obtained based on the bioimpedancimeter (BIA) InBody R20[®] \leq 19%; Body Mass Index (BMI) \leq 25kg/m² mg/dl and Abdominal circumference (CA) \leq 92cm.

The data were tabulated with double entry in Microsoft Excel spreadsheets[®] 2010, and later analyzed by statistical environment R, version 3.0.1. Descriptive and normal data analyses were performed according to the Shapiro-Wilk test. In cases where the normality parameters were satisfactory, Student's t-test was analyzed for two dependent samples when two means (before and after) of the same group were compared, and the Student's t-test for two independent samples, when comparing the means for two different groups at baseline and follow-up. When the variables had asymmetric distribution, the Wilcoxon test was used in the paired evaluation and the Mann-Whitney test in the independent evaluation. Proportions were made with McNemar's tests. A significance level of 5% was adopted for all tests⁽¹⁹⁾.

It is noteworthy that, at baseline, the participants of the two groups did not present significant differences in relation to the general characteristics (age, marital status, schooling and

skin color) and in the knowledge score on risk factors for CVD, which allowed comparability between them.

The study was developed in accordance with Resolution n. 466/12 of the National Health Council (NHC), and approved by the Standing Human Research Committee of the signatory institution (Opinion n. 500.375/2013). All participants signed two copies of the Informed Consent Form (ICF).

Results

Most of the men participating in this study had eight or more years of schooling (61.7%), had a mean age of 38.23 (\pm 12.44) years, being predominantly Afro descendant (58.7%), Catholic (64.3%) and with a partner (72.1%). Regarding cardiovascular risk factors, 18.3% had Arterial Hypertension, 23% were smokers, 67% did not practice physical activity regularly, 43.5% consumed excessive alcoholic beverages and 69.5% had inadequate diet.

Of the 67 individuals included in the intervention group, 35 (52.2%) participated in the second evaluation, since 18 workers were disconnected from the company before the end of the intervention and 14 gave up participating in educational activities, justified by the fact that they were performed during rest hours. It is worth noting that the participants showed interest in the activities that were being carried out, since they usually arrived before the scheduled time and brought to the group their own doubts and also of their wives. In addition, one of the participants, even on medical leave for forearm fracture, continued to attend the meetings. Furthermore, colleagues who were not members of the intervention subgroups repeatedly sought out the researchers for blood pressure verification and asked if they could stay for the meeting.

Of the 68 men included in the control group, 37 (54.4%) participated in the second evaluation, since 6 refused to answer the questionnaire again and 25 were disconnected from the company. The number of workers disconnected is due to the type of activity of the company, which is linked to the period of the agricultural harvest in the region.

Table 1 shows the general characteristics of the groups, as well as risk factors related to cardiovascular health behavior. In the intervention group, there was a reduction of almost 38% in the sedentary rate and 31% and 32% in excessive alcohol consumption and inadequate eating, respectively, and a 20.9% increase in going to work on foot or by bicycle. In the control group,

there was a reduction of approximately 15% in the sedentary rate and 22% in inadequate eating, but there was a 10% reduction in the displacement of workers to the service on foot or by bicycle. It should be noted that during the intervention one of the participants quit smoking, triggering an important reduction in the percentage related to the variable smoking habit.

Table 1— General characteristics of behavior and cardiovascular risk factors involved between control and intervention groups before and after intervention. Maringá, Paraná, Brazil - 2014. (N = 72)

Variables	Overall characteristics p-value	Control Group (n=37)				Intervention Group (n=35)			
		Before	After	$\bar{x} \neq$	p-value	Before	After	$\bar{x} \neq$	p-value
Social risk factors									
Schooling: ≥ 8 years of study (%)	0.436 [‡]	56.8				65.7			
Biological risk factors									
Prevalence of overweight (%)	0.096 [‡]	48.6	37.8		0.376 [‡]	48.6	48.6		0.544 [‡]
Prevalence of obesity (%)	0.501 [‡]	8.1	8.1			20.0	20.0		
Weight loss (Kg)	0.046 ^a			21	0.341 [‡]			10	0.555 [‡]
Systolic BP (mmHg)	0.762 ^a	133.2	136.0		0.132 [‡]	130.6	128.6		0.455 [‡]
Diastolic BP (mmHg)	0.653 ^a	90.2	88.4		0.386 [‡]	87.7	79.7		<0.001 [‡]
Behavioral risk factors									
Physical inactivity (%)	0.059 ^a	72.9	62.1		1.000 [‡]	68.6	42.8		0.344 [‡]
Excessive alcohol consumption (%)	0.600 ^a	43.2	43.2		1.000 [‡]	35.1	24.3		0.344 [‡]
Smoking habit (%)	0.118 ^a	29.7	29.7		1.000 [‡]	13.5	10.8		1.000 [‡]
Goes to work: on foot or by bicycle (%)	0.345 ^a	54.0	48.6		0.625 [‡]	42.5	51.4		0.453 [‡]
Inadequate eating* (%)	0.098 ^a	62.2	48.6		0.302 [‡]	75.7	51.4		0.035 [‡]
Daily meals (x/day)	0.659 [‡]	2.97 \pm 1.14	3.08 \pm 0.86	0.1	0.568 [‡]	3.08 \pm 1.01	3.51 \pm 1.33	0.4	0.015 [‡]
Intake of vegetables and legumes (x/week)	0.919 ^a	4.62 \pm 2.64	1.94 \pm 2.27	-2.7	0.117 [‡]	5.42 \pm 1.97	5.34 \pm 1.71	-0.1	0.924 [‡]
Intake of fried food (x/week)	0.789 ^a	2.72 \pm 2.31	2.83 \pm 2.25	0.1	0.446 [‡]	3.14 \pm 2.48	3.17 \pm 2.18	0.03	0.289 [‡]
Use of industrialized spices (x/week)	0.941 ^a	5.37 \pm 2.73	3.83 \pm 3.08	-1.5	0.271 [‡]	3.54 \pm 3.11	1.91 \pm 2.39	-1.6	0.689 [‡]
Water intake (liters/day)	0.832 [‡]				0.051 [‡]				0.005 [‡]

Source: Created by the authors.

Notes: Data presented as means (\bar{x}) and standard deviations, except for those indicated as percentages (%).

* According to the Ministry of Health⁽²²⁾; † Wilcoxon's Test; ‡ t-Student's Test; ‡ McNemar's Test; ^a Mann-Whitney's Test.

Regarding eating habits (Table 1), the factors that were most sensitive to the intervention were the number of daily meals and water consumption. Moreover, the frequency of inadequate eating habits decreased approximately 20% in both groups. However, the correlation analysis between the initial and final moment showed that in the intervention group the variables number of daily meals, water consumption and inadequate eating presented significant alteration, while in the control group, this occurred only for water consumption.

In relation to anthropometric and hemodynamic variables, only DBP showed a significant reduction; this occurred only in the intervention group. In relation to body weight, despite important reductions in the individual scope, they were not sufficient to decrease significantly the average weight of the group.

Discussion

The data showed that, even with a significant reduction in water intake by metalworkers in the intervention group, there was a significant increase in healthy eating habits (reduction in the percentage of men who used industrialized spices and an increase in the number of meals performed per day). Moreover, although without statistically significant difference, there was the onset of other behaviors that may affect the prevention of cardiovascular diseases, such as reduced physical inactivity, excessive alcohol consumption and smoking. Those results provide support for the planning and implementation of health education actions by nurses and other members of the multidisciplinary team, especially those working in Primary Care. Those actions, as proposed by CCCM⁽²¹⁾, should prioritize health promotion and prevention of diseases and complications, focusing on modifiable risk factors, more specifically those related to life habits.

A non-randomized experimental study conducted in Brazil with 157 adults of both sexes identified that the interventions consisting of health education on physical exercise and weekly classes of cardiorespiratory exercises were effective – they increased the practice of

physical activity. However, health education was more effective in maintaining this practice in the post-intervention period. In this sense, the authors recommend that both modalities of interventions be used within the scope of the Unified Health System (UHS), to promote physical activity⁽²³⁾.

On the other hand, an intervention study conducted with 54 men living in rural United States found that participants were aware of modifiable cardiometabolic risk factors (physical activity, diet and tobacco use); however, they did not feel able to adopt healthy behaviors, except for those participants who experienced the occurrence of a cardiovascular emergency in the family and those who were closer to the age of sixty. Thus, the authors concluded that the occurrence of a family emergency and the desire to mitigate the cognitive declines caused by aging were factors that encouraged the change of habits in men⁽²⁴⁾. Thus, in health education activities, it is important to make use of practical examples and strategies that encourage individuals to share experiences lived, as this can favor awareness and changes, even small, in daily habits/behaviors.

In relation to the specific context of male workers, the challenge of developing, implementing and adhering to actions focusing on health promotion and disease prevention stands out, which make up two strategic axes of the CCCM. A study conducted with rural workers, whose objective was to understand the perceptions of care practices, pointed out the predominance of the view of care centered on the biomedical model, besides the fact that they consider work as a tool to take care of health⁽²⁵⁾. Therefore, actions related to health promotion and disease prevention among the general population, more especially men, need to achieve the meaning of health and disease and provide space for discussion, especially in the work environment itself.

Moreover, a Brazilian study highlighted the successful actions promoted by family health strategy teams with patients with diabetes, which included from the provision of groups (nutritional support, walking, health education), individual

consultations, medication distribution, to “good care”. This demonstrates the importance of the quality of the relationship between patients and health professionals, in the empowerment, participation and responsibility of the patient in relation to their care plan⁽²⁶⁾. Thus, when entering the extramural spaces of the Health Units, the team initially needs to establish a relationship of trust with the target audience and make use of strategies that arouse interest in the discussion of the themes of promotion and prevention, such as the valorization of active listening.

The results of this study also corroborate those of a quasi-experimental study conducted with people with Metabolic Syndrome in China⁽²⁷⁾, which identified that a lifestyle intervention program guided by the Health Promotion Model, led by nurses, effectively improved self-efficacy and the implementation of health-promoting behaviors, which includes cardiovascular health. Likewise, a randomized controlled pilot study conducted with 59 men in the United States identified a positive impact of a tele-care intervention in primary care. The purpose was to promote lifestyle changes to reduce cardiovascular risk factors, and at the end of 12 weeks, a significantly higher proportion of participants in the intervention group lost at least 5% of their initial weight⁽¹¹⁾.

A study conducted in the community of Paraisópolis, São Paulo, with seven professionals and nine adult men, inferred that the dialogical actions performed by a focus group contributed to the promotion of the health of the participants by stimulating the (re)knowledge of determinants of their living conditions and health⁽¹¹⁾. A randomized clinical trial, developed with 72 users with Diabetes Mellitus from a municipality in the Brazilian Amazon, identified that culture circles with an educational approach can improve self-care related to healthy eating, physical exercise and foot care, resulting in improvement of some cardiovascular risk parameters (fasting capillary glycaemia, systolic and diastolic blood pressure, Body Mass Index and abdominal circumference)⁽²⁸⁾.

In the present study, in addition to having observed a decrease in physical inactivity, alcohol

consumption and inadequate eating, there was an increase in the proportion of individuals who began to go to work on foot or by bicycle. This may have been influenced by the encouragement of professionals in the health education program, who encouraged the adoption of alternatives capable of modifying daily life and, at the same time, characterizing a healthier lifestyle. It is worth mentioning that the encouragement and agreement of small changes in daily life is one of the strategies of the CCCM⁽²¹⁾.

In this regard, a randomized controlled study conducted with 1,113 male fans, who used a European Training Fans Program (EuroFIT) as an intervention to improve physical activity and sedentary time, found improvement in eating habits, decrease in alcohol intake, reductions in average body weight, BMI, waist circumference and significant cardiovascular risks⁽²⁹⁾. Those results led the authors to conclude that all the different ways of promoting and encouraging health promotion are plausible and that physical activity is an effective means to involve men with health-related issues⁽²⁹⁾. In this sense, thinking about joint actions with companies, aiming to enable work activities to be implemented in the routine of the service, constitutes an initial incentive to perform physical exercise.

Concerning eating habits, there was a reduction, although not significant, in the number of individuals who used industrialized spices, which allows affirming that this may have contributed to the significant reduction in DBP levels in the intervention group. Moreover, the increase in the average “number of daily meals” also demonstrates the effort made by workers to achieve a healthier lifestyle. This result corroborates the intervention consisting of traditional consultations associated with personalized counseling, through telephone calls from primary care nurses in Concepción, Chile. In men, the effects of the intervention were: decreases in systolic and diastolic pressure, abdominal circumference, total cholesterol, low density lipoprotein cholesterol, atherogenic index, cardiovascular risk factor and coronary risk⁽³⁰⁾.

An intervention addressing people with diabetes found that, among the proposed activities related to self-care, the adoption of

healthy eating was one of those with the lowest rates of adoption, justified by the cultural issue of the participants⁽²⁸⁾. Those results confirm that the individual commitment of the participants to the adoption of healthier lifestyle habits should always be encouraged by health professionals, who should even clarify that they are not always able to, in a short time, result in significant changes in body weight, stressing the importance of long-term persistence.

Another aspect that needs to be considered is the cost for changes in men's eating standards to occur. A study conducted with data from the Brazilian Institute of Geography and Statistics (IBGE) identified that of the 55,406 households investigated, 39.4% were classified as Food Insecurity, of whom the majority (93.9%) was identified by the "difficulty of living life until the end of the month with the available income". It is emphasized that economic aspects, unsatisfactory living conditions, home and surrounding problems presented a significant association with Food Insecurity⁽³¹⁾. Thus, the cost interferes with the consumption of fruits, vegetables and legumes, evidencing that, for the Brazilian population in general, including men, issues related to income affect the selection of foods to be consumed.

Finally, it is important to highlight that the results of this and other studies point to the relevance of interventions, although of short duration, in the change in eating habits. In the case of men, this seems to be particularly important when they occur in the workplace⁽¹²⁾. Future studies, however, need to be conducted, not only to identify whether those changes are lasting or not, but primarily to identify their benefits.

The limitations of this study include the short follow-up period, the sample size, mainly due to the losses that occurred during the intervention. Moreover, a difficulty found was the need to adjust the researcher's schedules with the research subjects, in addition to the contamination of information that may have occurred among the workers of the two groups, because they worked in the same company and, sometimes, even in the same sectors, side by side, and even sharing the same environment during the lunch period.

Conclusion

The comparison before and after the intervention showed statistically significant differences only for the following variables: number of daily meals, inadequate diet, daily water consumption and diastolic blood pressure. However, it can still be concluded that the educational intervention was effective and capable of producing a positive impact on male workers in relation to cardiovascular risk factors, especially those related to behavior – physical activity and eating habits.

It is noteworthy that the results of this study demonstrate that care practices with male metalworkers are effective and necessary for health promotion and prevention of diseases and complications. Thus, the role that the nursing professional can play in this process, as part of one of his/her duties, of health educator, stands out. Nurses need to be encouraged to adopt health interventions directed to this population, in order to enable the reduction of morbidity and mortality in this specific public.

The improvement in the eating behavior of the intervention group was consistent with that of other studies and indicates the effectiveness of intervention programs aimed at health education, as well as demonstrates the importance and need for further studies with workers, especially male workers, given the limitations they find to seek health services in the scope of primary health care.

Collaborations:

1 – conception, design, analysis and interpretation of data: Sonia Silva Marcon, Gabriela Schiavon Ganassin and Guilherme Oliveira de Arruda;

2 – writing of the article and relevant critical review of the intellectual content: Sonia Silva Marcon, Gabriela Schiavon Ganassin, Guilherme Oliveira de Arruda, Elen Ferraz Teston, Mayckel da Silva Barreto, Verônica Francisqueti Marquete and Patrícia Chatalov Ferreira;

3 – final approval of the version to be published: Sonia Silva Marcon, Gabriela Schiavon

Ganassin, Guilberme Oliveira de Arruda, Elen Ferraz Teston and Mayckel da Silva Barreto.

References

1. Paraná. Secretaria de Estado da Saúde do Paraná. Superintendência de Atenção à Saúde. Linha Guia de Hipertensão Arterial/ SAS. 2a ed. Curitiba: SESA; 2018.
2. World Health Organization. Cardiovascular diseases (CVDs) [Internet]. Geneva (CH); 2016 [cited 2016 Mar 29]. Available from: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))
3. Oliveira GMM, Brant LCC, Polanczyk CA, Biolo A, Nascimento BR, Malta DC, et al. Cardiovascular Statistics – Brazil 2020. *Arq Bras Cardiol.* 2020;115(3):308-439. DOI: <http://dx.doi.org/10.36660/abc.20200812>
4. Eriksson HP, Söderberg M, Neitzel RL, Torén K, Andersson E. Cardiovascular mortality in a Swedish cohort of female industrial workers exposed to noise and shift work. *Int Arch Occup Environ Health.* 2020. DOI: <https://doi.org/10.1007/s00420-020-01574-x>
5. Tannis C, Chernov C, Perlman S, McKelvey W, Toprani A. Cardiovascular Health Risk Behaviors by Occupation in the NYC Labor Force. *J Occup Environ Med.* 2020;62(9):757-63. DOI: 10.1097/JOM.0000000000001960
6. Souza MFM, Passos VMA, Malta D, França EB, Abreu D, Araújo VEM, et al. Burden of disease in Brazil, 1990–2016: a systematic subnational analysis for the Global Burden of Disease Study 2016. *Lancet.* 2018;392(10149):760-75. DOI: 10.1016/S0140-6736(18)31221-2
7. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Análise em Saúde e Vigilância de Doenças Não Transmissíveis. VIGITEL Brasil 2019: vigilância de fatores de risco e proteção para doenças crônicas por inquérito telefônico [Internet]. Brasília; 2020 [cited 2020 Jul 25]. Available from: <https://portal.arquivos2.saude.gov.br/images/pdf/2019/julho/25/vigitel-brasil-2018.pdf>
8. Baker P, Shand T. Men's health: time for a new approach to policy and practice? *J Glob Health.* 2017;7(1):010306. DOI: 10.7189/jogh.07.010306
9. Arruda GO, Marcon SS, Peruzzo HE, Ruiz AGB, Back IR, Nass EMA, et al. Intervenção educativa em homens com diabetes mellitus: efeitos sobre comportamentos e perfil antropométrico. *Acta paul enferm.* 2020;33:eAPE20190128. DOI: 10.37689/acta-ape/2020ao0128
10. Torres VN, Willians EC, Ceballos RM, Donovan DM, Ornelas IJ. Participant Satisfaction and Acceptability of a Culturally Adapted Brief Intervention to Reduce Unhealthy Alcohol Use Among Latino Immigrant Men. *Am J Mens Health.* 2020;14(3):1557988320925652. DOI: 10.1177/1557988320925652
11. Marra MV, Lilly CL, Nelson KR, Woolfer DR, Malone J. A Pilot Randomized Controlled Trial of a Telenutrition Weight Loss Intervention in Middle-Aged and Older Men with Multiple Risk Factors for Cardiovascular Disease. *Nutrients.* 2019;11(2):229. DOI: 10.3390/nu11020229
12. Seaton CL, Bottorff JL, Jones-Bricker M, Lamont S. The Role of Positive Emotion and Ego-Resilience in Determining Men's Physical Activity Following a Workplace Health Intervention. *Am J Mens Health.* 2018;12(6):1916-28. DOI: 10.1177/1557988318803744
13. Précoma DB, Oliveira GMM, Simão AF, Dutra OP, Coelho OR, Izar MCO, et al. Updated Cardiovascular Prevention Guideline of the Brazilian Society of Cardiology - 2019. *Arq Bras Cardiol.* 2019;113(4):787-891. DOI:10.5935/abc.20190204
14. Anderson L, Brown JPR, Clark AM, Dalal H, Rossau HKK, Bridges C, et al. Patient education in the management of coronary heart disease. *Cochrane Database Syst Rev.* 2017;(6):CD008895. DOI: 10.1002/14651858.CD008895.pub3
15. Santos FNP, Baldissera VDA, Toledo RF. Conversa de Boteco: participação, educação e promoção da saúde do homem. *Esc Anna Nery.* 2019;23(3):e20190006. DOI: 10.1590/2177-9465-ean-2019-0006
16. Köhler AK, Tingström P, Jaarsma T, Nilsson S. Patient empowerment and general self-efficacy in patients with coronary heart disease: a cross-sectional study. *BMC Fam Pract.* 2018;19(1):76. DOI: 10.1186/s12875-018-0749-y
17. Silveira PM, Silva KS, Mello GT, Knebel MTG, Borgatto AF, Nahas MV. Tabagismo em trabalhadores da indústria no Brasil: associação com fatores sociodemográficos, consumo de bebidas alcoólicas e nível de estresse. *J bras pneumol.* 2020;46(1):e20180385. DOI: 10.1590/1806-3713/e20180385

18. Barros CT, Gontijo DT, Lyra J, Lima LS, Monteiro EMLM. "Mas se o homem cuidar da saúde fica meio paradoxal ao trabalho": relação entre masculinidades e cuidado à saúde para homens jovens em formação profissional. *Saúde Soc.* 2018;27(2):423-34. DOI: 10.1590/S0104-12902018166057
19. Ganassin GS, Silva EM, Pimenta AM, Marcon SS. Efetividade da intervenção educativa no conhecimento de homens relacionado às doenças cardiovasculares. *Acta paul enferm.* 2016;29(1):38-46. DOI: <https://doi.org/10.1590/1982-0194201600006>
20. Pichon-Rivière E. *Teoria do vínculo.* São Paulo: Martins Fontes; 1988.
21. Mendes EV. O cuidado das condições crônicas na atenção primária à saúde: o imperativo da consolidação da estratégia da saúde da família. Brasília (DF): Organização Pan-Americana da Saúde; 2012 [cited 2016 Apr 14]. Available from: https://bvsm.s.saude.gov.br/bvs/publicacoes/cuidado_condicoes_atencao_primaria_saude.pdf
22. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Guia alimentar para a população brasileira [Internet]. 2a ed. Brasília (DF); 2014 [cited 2014 Mar 2]. Available from: https://bvsm.s.saude.gov.br/bvs/publicacoes/guia_alimentar_populacao_brasileira_2ed.pdf
23. Ribeiro EHC, Garcia LMT, Salvador EP, Costa EF, Andrade DR, Latorre MRDO, et al. Assessment of the effectiveness of physical activity interventions in the Brazilian Unified Health System. *Rev Saúde Pública.* 2017;51:56. DOI: 10.1590/S1518-8787.2017051006654
24. Morgan EH, Graham ML, Folta SC, Seguin RA. A qualitative study of factors related to cardiometabolic risk in rural men. *BMC Public Health.* 2016;16:305. DOI: 10.1186/s12889-016-2977-1
25. Miranda SVC, Duraes OS, Vasconcellos LCF. A visão do homem trabalhador rural norte-mineiro sobre o cuidado em saúde no contexto da atenção primária à saúde. *Ciênc saúde coletiva.* 2020;25(4):1519-28. DOI: 10.1590/1413-81232020254.21602018
26. Moreschi C, Rempel C, Backes DS, Pombo CNF, Siqueira DF, Pissaia LF. Ações das equipes da ESF para a qualidade de vida das pessoas com diabetes. *Ciênc Cuid Saúde.* 2018;17(2)e-41000. DOI: 10.4025/ciencucidsaude.v17i2.41000
27. Zheng X, Yu H, Qiu X, Chair SY, Wong EML, Wang Q. The effects of a nurse-led lifestyle intervention program on cardiovascular risk, self-efficacy and health promoting behaviours among patients with metabolic syndrome: Randomized controlled trial. *Int J Nurs Stud.* 2020;109:103638. DOI: 10.1016/j.ijnurstu.2020.103638
28. Correa ST, Castelo-Branco S. Amandaba no Caeté: círculos de cultura como prática educativa no autocuidado de portadores de diabetes. *Saúde debate.* 2019;43(123):1106-19. DOI: 10.1590/0103-1104201912310
29. Wyke S, Bunn C, Andersen E, Silva MN, van Nassau F, McSkimming P, et al. The effect of a programme to improve men's sedentary time and physical activity: The European Fans in Training (EuroFIT) randomised controlled trial. *PLoS Med.* 2019;16(2):e1002772. DOI: <https://doi.org/10.1371/journal.pmed.1002772>
30. Vilchez Barboza V, Klijn TP, Salazar Molina A, Sáez Carrillo KL. Eficácia de uma intervenção personalizada de aconselhamento em enfermagem, presencial e telefônica, para fatores de risco cardiovascular: ensaio clínico controlado. *Rev Latino-Am Enfermagem.* 2016;24:e2747. DOI: 10.1590/1518-8345.0626.2747
31. Araújo ML, Nascimento DR, Lopes MS, Passos CM, Lopes ACS. Condições de vida de famílias brasileiras: estimativa da insegurança alimentar. *Rev bras estud popul.* 2020;37:e0110. DOI: 10.20947/s0102-3098a0110

Received: September 4, 2020

Approved: November 7, 2020

Published: January 19, 2021



The *Revista Baiana de Enfermagem* use the Creative Commons license – Attribution -NonComercial 4.0 International. <https://creativecommons.org/licenses/by-nc/4.0/>

This article is an Open Access distributed under the terms of the Creative Commons (CC BY-NC). This license lets others remix, adapt and create upon your work to non-commercial use, and although new works must give its due credit and can not be for comercial purposes, the users do not have to license such derivative works under the same terms.