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Original Article

Espaço Movimento: Physical exercise program as prevention strategy in supplementary care

Espaço Movimento: Programa de exercício físico como estratégia de prevenção na saúde suplementar

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Abstract

The aim of this study was to describe a program of health promotion and prevention of risks and diseases, developed by a health plan provider by means of results achieved and activities since its inception. To demonstrate the results, active and retired employees of UFV Campus Florestal and their dependents were selected, enrolled with this provider, to attend Espaço Movimento in two groups: gym (GG) and walking/running (WRG). All were submitted to anthropometric and mood profile evaluation, and a flexibility test at baseline and every six months; VO_{2max} was assessed only for WRG. Submitted to 12 months of intervention, GG was composed of 45 participants (25 male), with mean age 46.1 ± 15.7 years. The WRG was subjected to six months of intervention, and composed of 12 participants (10 females), with mean age 42.8 ± 13.8 years. The logical model from 2013 to 2015 was used to present the activities. Results of both groups showed significant improvements in levels of physical fitness, anthropometric variables and mental health. Between the years 2013 and 2015, three annual events were offered to the community of Florestal, including a wider range of age, from children to seniors. Therefore, the proposal of the Espaço Movimento initiative seems to be innovative in the supplementary care and demonstrates effectiveness on the observed results.

Keywords

Supplementary Health; Health education; Multi-professional team; Physical activity.

Resumo

O objetivo desse estudo foi descrever um programa de promoção da saúde e prevenção de riscos e doenças desenvolvido por uma operadora de saúde suplementar por meio de resultados atingidos e atividades realizadas desde sua implementação. Para demonstrar os resultados atingidos foram selecionados servidores ativos e inativos da UFV Campus Florestal, e seus dependentes, participantes dessa operadora, atendidos no Espaço Movimento nas duas modalidades, grupo da academia (GA) e grupo de caminhada/corrida (GCC). Todos foram submetidos à avaliação antropométrica e de perfil de estado de humor, e a um teste de flexibilidade no momento inicial e a cada seis meses; e apenas no GCC foi avaliado o $VO_{2Máx.}$ O GA, submetido a 12 meses de intervenção, foi composto por 45 participantes, 25 homens e 20 mulheres, com idade média de 46,07 ± 15,74 anos. O GCC, submetido a seis meses de intervenção, foi composto por 12 participantes, 10 mulheres e dois homens, com idade média de 42,75 ± 13,84 anos. Para apresentar as atividades realizadas foi utilizado o modelo lógico adotado no período de 2013 a 2015. Os resultados de ambos os grupos atendidos apresentaram melhoras significativas nos índices de aptidão física, variáveis antropométricas e de saúde mental. Entre o período de 2013 a 2015 foram desenvolvidos três eventos que são oferecidos anualmente à comunidade de Florestal, os quais abrangem uma ampla faixa etária, de crianças à idosos. Diante do exposto, a proposta do Espaço Movimento parece ser inovadora na saúde suplementar e se demonstra efetiva diante dos resultados observados.

Palavras-chave

Saúde Suplementar; Educação em saúde; Equipe multiprofissional; Atividade física.

Introduction

For some time, health has been understood as a complete physical, mental, social and spiritual well-being and not only the absence of disease[1]. The Ministry of Health, through the National Policy for Health Promotion, aims to promote quality of life and prevent risk behaviors for health of the Brazilian population[2].

Since physical inactivity has been seen as one of the main risk factors for non-communicable chronic diseases (NCDs), physical activity has become an essential piece of the policies developed by the government in the realm of health[3]. According to a study by Lee et al.[4], worldwide, physical inactivity is responsible for six and 10% of main NCDs.

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To reinforce the seriousness of these statistics, recent data from the Brazilian Institute of Geography and Statistics (IBGE) indicates that 45% of the Brazilian population is insufficiently active[5], that is, perform less than 150 minutes per week, which is the recommendation for the maintenance of health[6].

It is known that regular physical activity, through its effects in the organism, may prevent and combat NCDs[4], also help prevent and treat psychological disorder and promote mental health[7]. Therefore, considering the high prevalence of physical inactivity allied to its significant risks related to NCDs, the increase in physical activity of a population contributes for public health, with high impact in the reductions of costs for treatments, including hospital, one of the reasons for its substantial social benefits[8].

The National Agency of Supplementary Health (ANS) is the regulating agency for health care providers in Brazil. In agreement with the Bill 9.961/00, it encourages the development of programs for health promotion and prevention of risks and disease, aiming to modify the current assistance model in the health system and improve quality of life of beneficiaries of health care plans[9].

Faced with this scenario related to consequences of sedentary behavior and the expressive number of beneficiaries 50,261,602 being served in private health care plans[10], which represents 25% of the Brazilian population, programs for health promotion and prevention of risks and diseases have become a differentiator for such health care providers. Therefore, the aim of this study was to describe a program of health promotion and prevention of risks and diseases developed by a supplementary health care provider through results and activities since its implementation.

Methods

The Program - Espaço Movimento

- **History, aims and target population**

After a pilot study (Integrate Program of Physical Activity, Sport and Leisure), the Agros Service of Physical Activity and Health (Espaço Movimento) began in 2013 in the Federal University of Viçosa, *Campus* Florestal (UFV-CAF), in partnership with its health care provider.

The main goal of Espaço Movimento is, through regular and programmed physical activity, to reach better physical fitness, adequate anthropometric data for prevention of risks and diseases, and promote mental well-being among active and inactive collaborators of UFV-CAF and their dependents, participating in the supplementary health care provider. Furthermore, to allow for a calendar of events for promotion of health through physical activity and a multi-professional approach for the entire community of Florestal, Minas Gerais, to stimulate health care.

- **Team and operations**

In accordance with Ravagnani et al.[11], Espaço Movimento is composed by a multi-professional team, physical educators, physician, nurse, dietitian, odontologist and representatives of the institutions involves, that gather monthly to discuss activities specific to the program and other important issues.

For the beneficiaries of the supplementary health care provider, two regular types of physical activity were offered, gym (stretching, aerobic and resisted exercises) and guided walking/running (stretching, outdoors aerobic and relaxing exercises). Participants can choose one of the two types and are submitted to the following stages:

1st Stage: Signing free consent form, commitment to Espaço Movimento routine, and Consent for the dependent in the case of a young person under 18 years of age.

2nd Stage: Physical assessment – performed by a physical educator, in which body weight (kg) and height (m) were used to calculate body mass index (BMI), using a Balmak 111 mechanic scale, with capacity for 150kg and divided by 100g and with 2m at a degree of 0.5cm. Waist and hip circumference were used for waist-to-hip ratio (WHR), using a Cescorf measuring tape. Body fat percentage (%BF) and muscle mass (%MM) (100 - %BF), using Faulkner's protocol[12], using a Cescorf scientific adipometer. Flexibility was measure through the seat and reach test[13] and profile for mood through Brunel's Mood Scale, BRUMS[14], which consists in a scale of 24 items divided into six dimension of mood: tension, depression, anger, vigor, fatigue and confusion. For participants in the walking/running group the 2400 meters' test was used to assess cardiorespiratory capacity[15] (after medical release), once the ergonomic test in the next stage targets assessment of cardiac function and not maximum cardiorespiratory capacity.

3rd Stage: Medical evaluation – to complement the clinical evaluation, laboratory exams (glucose, total and partial cholesterol, triglycerides and uric acid) and ergonomic test.

4th Stage: Training prescription: Gym or guided walking/running – sessions are prepared by responsible physical educator, based on recommendations[16-20] following the profile and need of each participant as identified in the physical and medical assessments. It is important to highlight the beginning and evolution of each participant in the physical activity were evaluated individually, considering their habitual physical activity, physical function, adaptation to stimuli and established goals, always in a perspective of health promotion and preventions of risks and diseases. For walking/running, the participants were divided into subgroups according to physical fitness and individual medical recommendations.

5th Stage: Reassessment of physical status, conducted every six months of regular physical activity, once the participant presents a minimum frequency of six sessions in a month. This criterion of monthly frequency was adopted as a maintenance criterion for the program, to guarantee the participant the minimum physical activity as recommended by the World Health Organization[21], adjusting volume and intensity according to frequency.

Ethics

Considering the nature of the study, the Espaço Movimento proposal was appreciated and approved by the Ethics Committee for Human Subjects Research, of the Federal University of Viçosa, as determined in the resolution nº 466/12 of the National Counsel of Health, under the registration number 487.635. All individuals taking part in Espaço Movimento were informed of the aims of the study and, in agreement, signed the free consent form.

Sample – Gym and Guided Walking/Running

To illustrate the results of the regular types of activities, a sample of the gym group (GG) and the walking/running group (WRG) was selected. Since the admission is ongoing, participants must have been under the GG intervention for 12 months and six months for the WRG. Participants who did not meet a minimum of six sessions per month or refused to participate were excluded.

The sample size for GG was 45 participants, 25 males and 20 females, with mean age 46.1 ± 15.7 years. Sample for WRG was composed by 12 participants, 10 females and two males, with mean age 42.8 ± 13.8 years.

Logical Model

To design the activities for Espaço Movimento during the period of 2013 to 2015

and clarify the strategy of the program, a logical model was developed, according to the Manual for Evaluation of Physical Activity[22], which states the logical model is a fundamental tool for program evaluation.

Statistical Analysis

To characterize the sample descriptive statistics was used. The normality of the data was verified by Kolmogorov-Smirnov test. The effect of the intervention for gym was analyzed through one-way ANOVA for repeated measures or Friedmam test, for parametric and non-parametric quantitative variables, respectively. For the effect of the intervention of walking/running a paired T test or Wilcoxon tests were used, for parametric and non-parametric quantitative variables, respectively. The level of significance adopted was $p \leq 0.05$ and the statistical software was Sigma Stat version 3.0.

Results

Tables 1 and 2 present the results of the gym activity. In anthropometric variables (Table 1) there was a significant decrease and increase in %BF and %MM, respectively, in the period of six and 12 months of intervention when compared to baseline ($p<0.001$).

Moreover, there was a significant increase in flexibility (Table 1) in the period of six and 12 months' intervention compared to baseline ($p<0.001$).

The assessment of mood status (Table 2) there was significant decrease in the dimension of anger after six months' intervention ($p= 0.024$) and the dimension tension ($p= 0.049$) after 12 months' intervention when compared to baseline. The dimension vigor increase significantly ($p= 0.013$) after six and 12 months' intervention when compared to baseline.

TABLE 1 – Results of anthropometric assessment and flexibility at baseline, after six and 12 months of intervention - Gym Group (n=45), Florestal, Minas Gerais, Brazil, 2015.

	Baseline (n=45)	6 months (n=45)	12 months (n=45)	p
BMI (kg/m^2)#	26.3 (23.9-28.7)	26.1 (23.3-28.5)	26 (23.7-28.3)	0.185
WHR#	0.8 (0.8-0.9)	0.8 (0.8-0.9)	0.8 (0.8-0.9)	0.201
%BF#	23.1 (19.1-26.1)	20.4 (16.5-23.9)*	19.6 (17.7-23.3)*	<0.001
%MM#	76.8 (73.8-80.9)	79.6 (76.1-83.5)*	80.4 (76.7-82.3)*	<0.001
Flex (cm)	24.3 ± 9.4	27.0 ± 8.9*	27.7 ± 9.3*	<0.001

BMI: Body mass index; WHR: waist-to-hip ratio; %BF: body fat percentage; %MM: muscle mass percentage; Flex: flexibility. *Significant difference when compared to baseline. #Non-parametric variable (Wilcoxon) presented in terms of median and interquartile range.

TABLE 2 – Results from the BRUMS questionnaire, at baseline, six and 12 months of intervention - Gym Group (n=45), Florestal, Minas Gerais, Brazil, 2015.

	Baseline (n=45)	6 months (n=45)	12 months (n=45)	p
Anger	0.5 ± 0.6	0.3 ± 0.4*	0.4 ± 0.5	0.024
Confusion	0.5 ± 0.6	0.3 ± 0.4	0.4 ± 0.9	0.129
Depression	0.4 ± 0.5	0.2 ± 0.3	0.4 ± 0.9	0.162
Fatigue	0.9 ± 0.8	0.6 ± 0.7	0.8 ± 0.9	0.082
Tension	1.3 ± 0.8	1.1 ± 0.8	1.0 ± 0.8*	0.049
Vigor	2.4 ± 0.9	2.7 ± 0.8*	2.8 ± 0.7*	0.013

*Significant difference when compared to baseline; BRUMS: Brunel's Mood Scale.

Tables 3 and 4 show results for the walking/running group. The anthropometric data (Table 3) show significant decrease for BMI ($p= 0.029$) and %BF ($p= 0.024$) and significant increase in %MM ($p= 0.007$). Physical tests (Table 3) present

significant increase in flexibility and $VO_{2Máx}$, p= 0.004 and p= 0.018, respectively.

The answers to BRUMS (Table 4) showed significant decrease in the anger dimension (p= 0.027).

TABLE 3 – Results of anthropometric assessment, flexibility and VO_{2Max} (mL.kg.min), at baseline and after six months of intervention – Guided Walking/Running Group (n=12), Florestal, Minas Gerais, Brazil, 2015.

	Baseline (n=12)	6 months (n=12)	P
BMI (kg/m^2)	29.0 ± 5.0	28.0 ± 4.6	0.029*
WHR	0.8 ± 0.1	0.8 ± 0.0	0.231
%BF	27.5 ± 8.7	24.9 ± 7.2	0.024*
%MM #	71.6 (58.7 – 80.2)	77.3 (69.2 – 81.2)	0.007*
Flex (cm)	26.5 (19.4 – 28.9)	26.5 (21.0 – 32.0)	0.004*
VO_{2Max} (mL.kg.min)	24.6 ± 5.2	26.6 ± 4.7	0.018*

BMI: Body mass index; WHR: Waist-to-hip ratio; %BF: body fat percentage; %MM: muscle mass percentage; Flex: flexibility; $VO_{2Max:}$ Maximum cardiorespiratory capacity. *Significant difference when compared to baseline. #Non-parametric variable (Wilcoxon) presented in terms of median and interquartile range.

TABLE 4 – Results from the BRUMS questionnaire at baseline and six months of intervention – Guided Walking/Running Group (n=12), Florestal, Minas Gerais, Brazil, 2015.

	Baseline (n=12)	6 months (n=12)	p
Anger	1.4 ± 1.2	0.5 ± 0.5	0.027*
Confusion	0.9 ± 1.1	0.5 ± 0.6	0.084
Depression	0.7 ± 0.8	0.5 ± 0.6	0.494
Fatigue	1.2 ± 1.3	1.1 ± 1.0	0.488
Tension	1.8 ± 1.0	1.2 ± 0.7	0.078
Vigor	3.0 ± 0.9	2.9 ± 0.8	0.487

*Significant difference when compared to baseline; BRUMS: Brunel's Mood Scale.

Figure 1 shows the logical model of Espaço Movimento as developed throughout the years 2013 to 2015, once it is ongoing[22]. It is important to highlight the events promoted regularly to serve the community of Florestal.

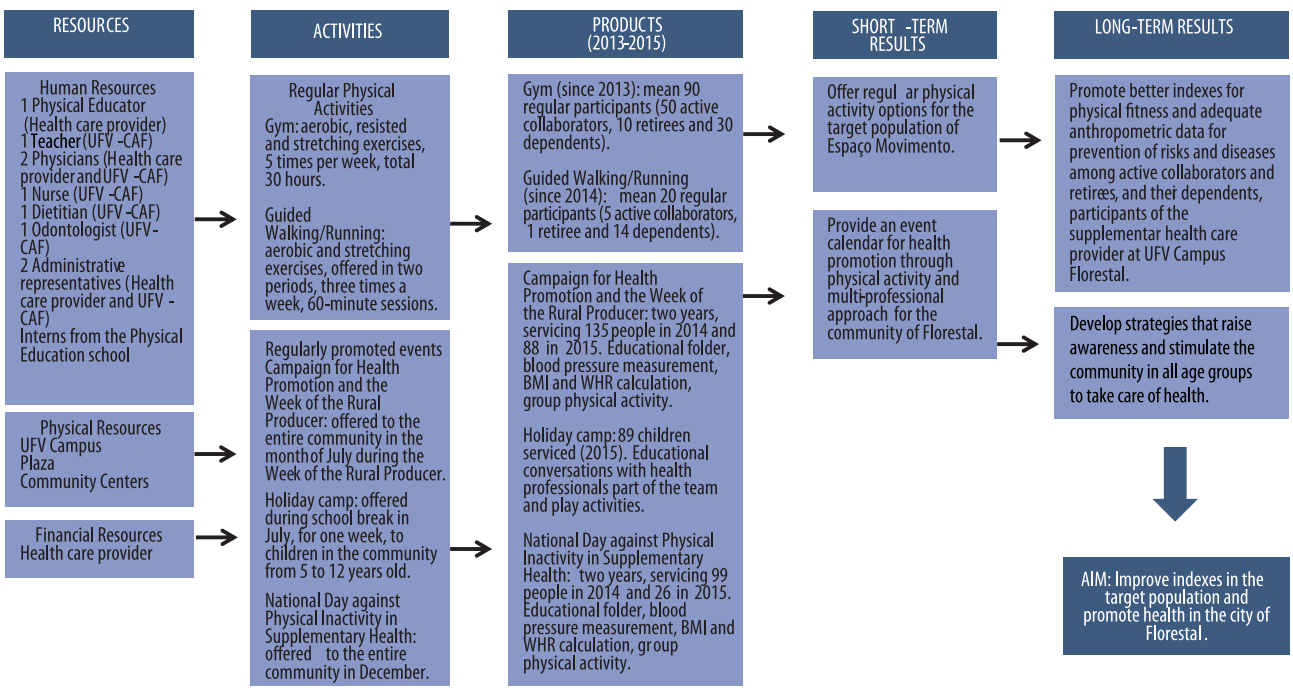

FIGURE 1 – Logical Model of the Program - Espaço Movimento (2013 – 2015), Florestal, Minas Gerais, Brazil.

Discussion

The results presented in this study are a consequence of a previous study[23], in which the proposal of Espaço Movimento was presented after six months of intervention with physical exercise (gym) resulted in significant improvement in important health indexes, what motivated the work team to persevere in the proposal and even broaden it.

In the previous study[23], the sample was subdivided in active collaborators, retirees and dependents, and this study presents the sample as whole. Independently, tables 1 and 2 show that participants completing 12 months in GG could maintain the benefits acquired after six months of intervention for the variables %BF, %MM and vigor, once there were no significant differences between the results at six and 12 months.

The variable flexibility was not studied previously[23], and increased significantly after six months in GG, and was maintained after 12 months, reinforcing the positioning of Cyrino et al.[24] stating that weight training, that is, resistive training, may contribute for the preservation or improvement of flexibility.

The results found in WRG (tables 3 and 4), initiated in 2014 with the aim to reach a higher number of people serviced by Espaço Movimento, and significant differences were found favorable to health after the intervention, such as improved body composition, physical fitness and mood profile.

This study presented significant decrease in BMI and %BF, and increase in %MM (Table 3) after six months of intervention with walking/running three times a week, as observed by Sabia et al.[25] evaluating the effect of continuous and interval aerobic exercise in obese adolescents after 16 weeks.

Though the age in this sample is different, weekly frequency and volume of sessions are similar to this study, moreover, Sabia et al.[25] presented the two conditions of aerobic exercise, continuous and interval, with similar effects on the variables, which reinforces the results obtained since the proposal of mixed intervention between continuous and interval training aims at the motivational factor, respecting the principle of variability in sports training[26].

On physical fitness, a significant increase was found in flexibility and $VO_{2Máx}$ (Table 4), what was probably due to the activities in each of the training sessions, composed initially by stretching exercises for multiple muscle groups with the execution of wide articular movement, and followed by the main aerobic exercise of walking/running, and ending with a sequence of relaxing exercises.

Similar results were found by Silva et al.[27] after 16 weeks of intervention, however, the sample in that study was composed by overweight adolescents, different from the target population serviced by the program, nonetheless, the multi-professional strategy was adopted, which incorporates educational strategies related to health, and physical practice composed of aerobic exercises of walking/running.

Considering the general proposal of Espaço Movimento for regular activities, Oliveira et al.[28] proposed a similar approach, a multi-professional intervention that began with physical assessment followed by physical activity prescription, being the main activities walking and weight lifting, and when necessary the reference to other health professionals.

The study[28] was composed by a sample of females with age similar to the participants in this study, with mean 42 years, and similarly found decrease and increase in %BF and muscular weight, respectively, and significant improvement in the dimensions of mood. The study by Oliveira et al.[28] also conducted six months' reassessments, however, during the intervals there was no tracking of physical activities performed, what is very clear in the proposal by Espaço Movimento and guarantees a safe and effective physical practice.

Furthermore, figure 1 presents the logical model built throughout the period between 2013 and 2015, where it is highlighted the events promoted periodically that also reach the entire community of Florestal. In such way, the proposal by Espaço Movimento goes beyond fulfilling the National Policy for Health Promotion and the guidance of ANS, since it also includes the concept of Health Promoter University, especially in the development of partnerships for health promotion and community action[29].

As limitations of this study, we acknowledge there is no control group, which prevents the full attribution of benefits to regular physical activity practice, and the lack of individual control for frequency which would allow us to better explore the association between frequency and the magnitude of results. Nonetheless, our work presents good external validity, once it reproduces a real environment of intervention with large groups, and with the exception of the previous study of our work team[22], there is no scientific literature, up to the present moment, a proposal of health promotion with intervention with physical exercise in the scope of supplementary health.

Therefore, the proposal of Espaço Movimento is highlighted as a significant multi-professional intervention in supplementary health, and for its methodology, which can contribute in the operationalization of actions looking for new lenses of observations and investments in primary health care.

Authors' contributions

V.C. Faria (0000-0003-4816-439X) participated of the conception of study, analysis and interpretation of the data, and writing of the manuscript. I.C.S. Pereira (0000-0002-1752-1721), M.A. Carvalho (0000-0003-0138-4125), E.A. Lima (0000-0002-7377-626X), R.S. Miranda (0000-0001-5849-7230), and G.A. Pussieldi (0000-0002-0275-5226) participated of analysis and interpretation of the data, and critic revision of the intellectual content. A.T. Simplício (0000-0002-2534-9765) was responsible for the conception and coordination of the Espaço Movimento Program, writing and critical review of the manuscript. All authors approved the final version.

Conflict of interest

The authors declare that there is not conflict of interest.

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