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Family Health Strategy: physical fitness from the city of Minas Gerais

Estratégia Saúde da Família: aptidão física de usuários de postos de saúde de uma cidade de Minas Gerais

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Abstract – The present study evaluated the level of physical activity and physical fitness of users of Family Health Strategy programs in the city of Divinópolis-Minas Gerais, which does not have Physical Education professionals. The 390 users of Family Health Strategy programs participated (145 men and 245 women), aged between 18 and 60 years. They were evaluated regarding their level of physical activity and health aspects, anthropometric measurements, body composition, and physical fitness tests: flexibility (sitting and reaching), muscular resistance (abdominal and arm flexion), and cardiorespiratory fitness. Of the participants, 71% practiced physical activity, good flexibility levels, and muscular strength resistance but had low cardiorespiratory fitness. Regarding body composition, men had a higher fat-free mass and lower body fat compared to women. Besides, 25% are classified as obese, 46% have chronic diseases, 29% are sedentary or irregularly active, 63% have already received instructions to perform physical exercise at health centers, and 99% understand the importance and need for Physical Education Professional in programs. Users practice physical activity but have low cardiorespiratory fitness and body composition due to a lack of targeted physical exercise. Although users receive guidance on practicing physical activity, they understand the need for the presence of a Physical Education professional in programs to perform physical exercise.

Key words: Sedentary behavior; Cardiorespiratory fitness; Unified Health System; Noncommunicable diseases; Cardiometabolic risk factors.

Resumo – *O objetivo do estudo foi avaliar o nível de atividade física e a aptidão física de usuários de programas de Estratégia Saúde da Família da cidade de Divinópolis-Minas Gerais, que não possuem profissionais de Educação Física. Participaram 390 usuários de programas Estratégia Saúde da Família (145 homens e 245 mulheres), com idade entre 18 e 60 anos. Foram avaliados quanto: ao nível de atividade física e aspectos de saúde, medidas antropométricas, composição corporal, testes de aptidão física – flexibilidade (sentar e alcançar), resistência muscular (abdominal e flexão de braço) – e aptidão cardiorrespiratória. Dos participantes, 71% praticam atividades físicas, bons níveis de flexibilidade e resistência muscular, no entanto, apresentaram baixa aptidão cardiorrespiratória. Em relação à composição corporal, os homens apresentaram maior nível de massa livre de gordura e menor gordura corporal em comparação com as mulheres. Além disso, 25% estão classificados com obesidade, 46% possuem doenças crônicas, 29% são sedentários ou irregularmente ativos, 63% já receberam indicações para realizar algum exercício físico nos postos de saúde, e 99% entendem a importância e necessidade do profissional de Educação Física nos programas. Os usuários são praticantes de atividade física, mas possuem baixo nível de aptidão cardiorrespiratória e composição corporal, o que pode ser devido à falta de exercício físico programado. Isso porque, apesar de os usuários receberem orientações para a prática de atividade física, compreendem a necessidade da presença do profissional de Educação Física nos programas para a realização de exercício físico.*

Palavras-chave: *Comportamento sedentário; Aptidão cardiorrespiratória; Sistema Único de Saúde; Doenças não transmissíveis; Fatores de risco cardiometabólico.*

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INTRODUCTION

Physical inactivity is an independent risk factor for cardiometabolic disease and all-cause mortality[1,2]. In Brazil, 45% of the population practices inadequate physical activity. Furthermore, 66% of the Brazilian population demands more than 3 hours of their free time in front of screens, which represents a high rate of sedentary behavior[3].

Sedentary behavior can promote a reduction in physical fitness levels, which will make it difficult to carry out daily activities, and low levels of flexibility, muscular strength, and cardiorespiratory fitness, which are also risk factors for the development of Chronic Diseases No Transmissible (NCDs) and are associated with higher morbidity and mortality rates[4,5].

Despite the wide variety of actions and programs related to physical activity widely encouraged by the Ministry of Health, it is observed that the low effectiveness of these strategies is still worrying[6]. Among the factors related to low effectiveness, we can find the lack of motivation to practice and the lack of Physical Education Professionals in these spaces. Thus, studies that diagnose the main risk factors, and how they have been prevented, can facilitate future treatments and structuring of public health actions.

Thus, the objective of this study was to evaluate the level of physical activity and physical fitness of users of Family Health Strategy programs in Divinópolis-MG city, which does not have Physical Education professionals.

METHODS

Ethical aspect

This exploratory and cross-sectional study was approved by the Research Ethics Committee of the State University of Minas Gerais, Divinópolis, by CNS Resolution 466/2012, 510/2016 and 580/2018 (process n. 42932921.3.0000.5115). The procedures to be adopted, risks and benefits were explained and were only part of the research after signing the Free and Informed Consent Form.

Population and sample

The study was developed in the city of Divinópolis, Minas Gerais-MG, with approximately 238,230 population, of which 110,400 population are users of the Family Health Strategy Program (ESF), representing 46% of the population. Thus, 390 users participated in the study.

The posterior sample calculation was carried out using version 3.1.7 of the G.Power program based on the statistical treatment foreseen for the present study. An alpha error of 0.05 was used sample size of group 1 (112 women) and group 2 (92 men). For the effect size variable, the value of 1.49 was used, obtained through the mean and standard deviation values using as a reference the fat percentage data from the collected sample (variable with the highest coefficient of variation in the study). Thus, the program calculated a statistical power greater than 0.99, based on the sample number and statistical analyses used in the present study[7].

Participants were recruited voluntarily, for convenience, through the dissemination of the research in folders and social networks, following inclusion

criteria: being patients cared for by the selected ESF, men and women, aged between 18 and 60 years old, and without any positive response to the Physical Activity Readiness Questionnaire (PAR-Q)[8] and no physical impediment to performing the physical tests.

Measurements

Sociodemographic aspects and health

A questionnaire was used to stratify the sample by age group, sex, history of illnesses, alcohol consumption, and smoking.

International Physical Activity Questionnaire (IPAQ)

It was used to assess the level of physical activity, and participants were classified according to the questionnaire guidelines[9].

Anthropometric measurements and body composition

The body weight and height were assessed using a digital scale with a precision scale of 100g (Welmy®). Subsequently, the Body Mass Index (BMI) was calculated and the participants were classified accordingly[10]. Waist and hip circumference measurements were taken with a flexible, inextensible measuring tape, with a precision of 0.1 cm, in an upright position, using conventional techniques[11]. Body composition measurements (percentage of fat-free mass, body fat, and skeletal muscle mass) were carried out using tetrapolar electrical bioimpedance (SANNY®), calibrated, by the manufacturer's regulations[12].

Flexibility

It was carried out through the sit and reach test, using the Wells bench[13].

Muscular strength resistance

An arm and abdominal flexion test was performed to assess muscular strength resistance, which required maximum repetitions to be performed within 1 minute[13].

Cardiorespiratory fitness

The Cooper test was performed after the Maximum Oxygen Consumption (VO2 max) was estimated[13].

Data analysis

The categorical and descriptive data are presented in the relative frequency (%), mean and standard deviation. For statistical analysis, the normality of the data was verified (Shapiro-Wilk test), and a comparative analysis was carried out between genders (Unpaired T test or Mann-Whitney test). The SPSS®

statistical software version 20.0 was used to perform data analysis and statistical significance was $p < 0.05$.

RESULTS

The 390 participants aged 34 ± 13 years were evaluated: 145 men (32 ± 12 years) and 245 women (34 ± 13 years). Regarding the Level of Physical Activity, 71% are considered active and very active, and 29% are sedentary and irregularly active, with an equivalence between females and males. Regarding the BMI classification, 25% of the studied population is classified as "obese", and women have higher numbers when compared to men (Table 1). Furthermore, 46% of participants have some type of chronic disease, 22% of participants are smokers, and 60% consume alcoholic beverages, with higher rates for males.

Table 1. Classification of Body Mass Index (BMI) and Physical Activity Level of users of Family Health Strategy Programs (ESF) in the city of Divinópolis, MG.

Classifications	Total (%)	Men (%)	Women (%)
BMI			
Under weight	3	5	1
Eutrophic	44	39	54
Overweight	28	39	25
Obesity	25	17	20
Physical Activity Level			
Sedentary	7	5	9
Irregularly active	22	23	21
Active	40	37	42
Very active	31	35	28

Note. BMI: body mass index; Classification according to the World Health Organization (WHO)[14]; Obesity was considered BMI >30 kg/m²; Sample size = 390 participants (245 women and 145 men).

For the assessment of health-related physical fitness, only 204 users completed (112 women and 92 men). In Table 2, it is possible to note the variables related to anthropometric measurements and body composition. Men have a lower percentage of fat and a higher percentage of fat-free mass and skeletal muscle mass when compared to women ($p<0.05$). Thus, women with a fat percentage are classified as moderately high and men as adequate. Regarding waist circumference and waist-hip ratio, men have higher values than women, but both are within the appropriate classification.

In Table 3, data relating to health-related physical fitness is presented, observed in both genders for the flexibility test, they are classified as "excellent". As for muscular strength resistance, they are classified in the abdominal and arm flexion tests, respectively, as "excellent" and "above average". While the Cooper test classification is "above average" for women and "very weak" for men, as well as VO2 max, for which women are classified as "regular" and men "very weak".

Furthermore, 59% said they participate in systematic physical exercise, 42% are monitored or supervised by a Physical Education professional, 50% stopped performing physical exercises (systematic) with the beginning of the COVID-19 quarantine, 63% have already received instructions to perform some physical exercise (by a physiotherapist, doctor, nutritionist, nurse, and others at health centers) and 99% acknowledged understanding the importance of the participation of physical education professionals in ESF posts.

Table 2. Anthropometric and body composition of users of Family Health Strategy Programs (ESF) in the city of Divinópolis, MG.

Variables	TOTAL	WOMEN	MEN	p-value
	M ± DP	M ± DP	M ± DP	
Weight (kg)	79 ± 14	63 ± 11	77 ± 13	*< 0.001*
Height (cm)	167 ± 0.1	162 ± 0.1	174 ± 0.1	<0.0001
BMI (kg/m2)	24 ± 4	24 ± 4	25 ± 5	0.348
Waist Circumference (cm)	78 ± 11	74 ± 10	82 ±10	<0.0001
Hip Circumference (cm)	99 ± 8	98 ± 9	99 ± 7	0.179
Waist/Hip Ratio	0.78 ± 0.1	0.75 ±0.1	0.82 ± 0.1	<0.0001
BF (%)	23 ± 10	28 ± 7	17 ± 8	*<0.0001*
BF (kg)	16 ±9	19 ± 8	14 ± 9	*<0.0001*
FFM (%)	77 ± 10	71 ±7	83 ± 8	*<0.0001*
FFM (kg)	53 ± 12	45 ± 5	63 ± 8	*<0.0001*
MME (%)	40 ± 8	35 ± 6	46 ± 6	*<0.0001*
MME (kg)	28 ± 8	22 ± 5	35 ± 5	<0.0001

Note. M ± DP: Data expressed as mean ± standard deviation; Statistical analysis: Mann-Whitney test; Statistical significance, p< 0.05; FFM: fat-free mass; BF: body fat; MME: skeletal muscle mass; BMI: body mass index; Sample size = 204 participants (112 women and 92).

Table 3. Physical fitness of users of Family Health Strategy Programs (ESF) in the city of Divinópolis, MG.

Variables	GERAL	MEN	WOMEN	p-value
	M ± DP	M ± DP	M ± DP	
Flexibility (cm)	23 ± 9	22 ± 8	24 ± 10	0.092
Cooper (meters)	1803 ± 467	1857 ± 456	1759 ± 473	0.070
VO2max (ml/kg/min)	23 ± 10	30 ± 10	28 ± 11	0.070
Push-up (rep)	26 ± 30	29 ± 12	23 ± 13	*0.0005*
Abdominal (rep)	37 ± 17	40 ± 12	35 ± 10	0.436

Note. M ± DP: Data expressed as mean ± standard deviation; Statistical analysis: unpaired t-test or Mann-Whitney test; Statistical significance, p< 0.05; VO_2max: maximum oxygen consumption; Sample size = 204 participants (112 women and 92 men).

DISCUSSION

The present study evaluated the level of physical activity and physical fitness of Family Health Strategy programs users in Divinópolis-MG city, which does not have Physical Education professionals. In this way, it was possible to observe that 71% of users practiced physical activities. However, they had low cardiorespiratory fitness, despite good levels of flexibility and muscular strength resistance. Regarding body composition, men had higher Fat-Free Mass and lower Body Fat, different from women. Furthermore, it was 25% are classified as obese, 46% have chronic diseases 29% are sedentary or irregularly active, 59% participate in a targeted activity related to physical exercise, 63% have already received instructions to perform some physical exercise in health posts, and 99% understand the importance and need for Physical Education professionals in Family Health Strategy posts.

High levels of physical fitness are associated with lower mortality and better quality of life in the adult population[4]. It was possible to observe low cardiorespiratory fitness for females and males. When comparing muscular flexibility and resistance, the majority had very good results.

The body mass is sensitive to changes resulting from factors such as the level of physical activity[15]. In the same sense, the study by Kochman et al.[16] observed better physical fitness in people with a lower impedance index and greater fat-

free mass. Just as another study shows that lower levels of physical activity and physical fitness are associated with higher body weight and BMI[17].

Regarding body composition, when the analysis was carried out according to gender, it was possible to observe that men had higher Fat-Free Mass and lower Body Fat, different from women. Furthermore, women tend to be less active when compared to men[18]. It is common for there to be a relationship with socioeconomic level, there is a greater possibility of involvement in physical activity when the person has a better condition, can outsource unpaid work, and has a greater chance of engaging in exercise[19]. And the more active you are, there is a tendency towards better fitness and body composition.

Physiologically, there are marked differences between the genders regarding exercise, men have greater muscle mass in absolute and relative terms (when divided by total body weight), while women have a higher percentage of fat. Furthermore, even with the same composition of muscle fibers, the volume of each fiber is greater in men, generating greater power and muscular resistance[20]. Another study shows that peripheral muscle fatigue due to exercise is greater in women than in men, which results in lower performance in physical tasks. Regarding absolute muscular strength, that of the average woman is 63.5% of the strength of a man[14]. These differences may justify the quantitative differences in the muscular resistance tests performed.

Regarding the level of physical activity, we found a high percentage of active and very active people. In another study conducted in basic health units (UBS) in the city of Belo Horizonte, Minas Gerais, UBS users showed a 33.7% level of sedentary lifestyle[21], corroborating the data in municipalities in the south and northeast of Brazil covered by UBS showed that 31.8% of adults are sedentary[22]. However, the current study presents a lower percentage of sedentary people, and people cared for within the scope of public health have a good level of physical activity. However, the questionnaire used covers activities such as transport, work, and leisure, beyond exercise, which may favor the high number of active people.

When analyzing the lifestyle of this population, it was observed that 22% of participants are smokers. Smoking is also considered a risk factor for the development of diseases and is estimated to be responsible for approximately 5.4 million deaths annually[23]. According to data presented by VIGITEL[2], 9.5% of the adult Brazilian population is a smoker, 11.7% among men and 7.6% among women. In our study, we did not find high levels of smoking in the studied population, and we also observed a higher number of smokers among men.

The consumption of alcoholic beverages is present in the lives of 60% of the population. Alcohol and drug abuse can have negative effects on motor skills and coordination abilities[24]. A study demonstrated a higher prevalence of male patients, dependent on multiple substances, with a low level of education, and who did not practice regular physical activity. The longer it is used, the worse the results in agility and balance tests. It is possible to conclude that both advancing age and longer dependence worsen performance in the variable's agility and body balance[24].

Furthermore, a sedentary lifestyle associated with low physical fitness may be directly related to the development of other chronic diseases, including those already diagnosed4. Corroborating these data, the study by Fletcher et al.[25] observed significant associations between a sedentary lifestyle, the presence of total and abdominal obesity, and a greater occurrence of arterial hypertension. Another study shows that in addition to physical fitness being

related to improved cardiovascular health, the physical fitness index is associated with practice time and supervision[26]. Thus, evidence shows that physical activity can reduce the risk of premature mortality by at least 20.0% to 30.0% for more than 25 types of chronic diseases[24].

Although the data shows that professionals working in primary care posts provide guidance and encourage the practice of physical activity, the presence of a Physical Education professional in these posts is necessary. In the same sense, the study by Moraes et al.[27] presents results that suggest that aspects of professional training and performance and the level of physical activity of professionals contribute positively to counseling actions for physical activity. Furthermore, when comparing the feasibility and cost-benefit of interventions with physical activity guidance and counseling and interventions with supervised physical exercise in primary care, it is observed that counseling is financially viable, but not as effective in promoting physiological changes. and physical interventions such as supervised physical exercise[28].

CONCLUSION

The users evaluated are practitioners of physical activity but have a low level of cardiorespiratory fitness and body composition, which may be due to the lack of supervised physical exercise. Because, although users receive guidance for practicing physical activity, they observed the need for the presence of a Physical Education professional in programs to carry out physical exercise.

In this sense, good physical activity is ideal for chronic disease prevention and treatment. It influences physical fitness and body composition, and the presence of a Physical Education professional in Primary Care and Health can assist in this process.

This study may help to understand the population's needs and help prevent specific risk factors. From this, proposals must be created to help prevent diseases. This study had as a limitation the lack of adherence of all participants in all phases of the study, in which only 52% carried out health-related physical fitness assessments.

Compliance with ethical standards

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Ethical approval

Ethical approval was obtained from the local Human Research Ethics Committee – Minas Gerais State University, Divinópolis and the protocol (no. 42932921.3.0000.5115) was written in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed experiments: CFCB; Performed experiments: LND, PVAR, JPSS, YLMV, AVLLC, APPM; Analyzed data: LND, PVAR, LTL; Contributed with reagents/materials/analysis tools: LRD, LTL, CFCB; Wrote the paper: LND, LRD, LTL, CFCB.

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