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EFFECTS OF PHYSICAL ACTIVITY ON THE QUALITY OF LIFE IN WOMEN WITH OVERWEIGHT AND POST MENOPAUSAL OBESITY

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ABSTRACT
This study aimed to analyze the impact of a physical exercise program adapted to the reality of the Family Health Units (FHUs), about Quality of Life (QoL) in women with overweight and obesity in postmenopausal. This is a descriptive, cross-sectional quantitative research conducted in FHU in a Midwestern city of São Paulo, Brazil. A convenience sample consisted of 68 postmenopausal women with overweight and obese equally and randomly allocated to the exercise group and the control group. The exercise program was based on the recommendations of the *American College of Sports Medicine* which is adapted to the conditions available at FHU. For data analysis it was used descriptive statistics and statistical parametric and nonparametric, with α set at 0.05. In the exercise group was found domains significantly higher than in the control group for the domains functional capacity, physical aspects, pain, general health, mental health and general perception of quality of life. The condition of health is determined by multiple factors and can be monitored by different indicators. QoL has performed an important indicator of the health condition due to its impact on the autonomy to carry out daily activities of postmenopausal women.

Keywords: Women. Menopause. Exercise. Quality of life.

INTRODUCTION

Aging is a gradual process characterized by morphological and physiological changes, functional, and biochemical associated with a reduction in capacity of homeostatic adaptation to situations of functional overload, making the body more susceptible to intrinsic and extrinsic aggression[1].

The postmenopausal period is approximately 1/3 of women's lives and is an important chronological milestone in the life cycle[2]. In females, aging and menopausal transition contribute to a rapid increase in metabolic and cardiac risk factors. The state of hypoestrogenism evidenced at this stage is associated with increased body fat, loss of lean body mass and cardiometabolic alterations that negatively impact the health and quality of life in this population. Exercise can be an option to resolve the risk for severe metabolic disorders and heart disease[3-4].

Quality of life (QoL) is defined as an eminently human concept, which has been approximated to the degree of satisfaction in family, social, environmental and existential aesthetic itself, as the standard of comfort and well-being[5]. Thus the symptoms that come with menopause are associated with impairments in QoL[6]. The age of menopause and body weight may influence the intensity of vasomotor symptoms, which has an additional effect on the decrease in functional fitness and vitality, as well as being associated with a higher occurrence of bodily pain mainly in the lumbar spine, knees and ankles[7].

It is estimated that most women will refer vasomotor and related to urogenital atrophy, in the years following the menopause, due to the

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decrease of estrogen levels, which can further compromise QoL and sense of well-being symptoms[7-8].

Assistance to women today transposes major challenges in ensuring healthy living and quality in life cycle phases[9]. The practice of supervised physical exercise has been suggested to minimize the symptoms of pain and how important to reduce the impact of aging on functional fitness, so as to contribute to the prevention and treatment of chronic diseases and reducing the risk of premature death[10]. For this reason, the Brazil's Ministry of Health has adopted public policies whose goal is to encourage the holding of regular physical activity in the general population[10].

The national scene within the Brazilian public health supports and justifies the need to develop research in this area as marked on the Pact for Health and the National Policy for the Promotion of Health, although the studies conducted to date suggest the efficacy of exercise on indicators of health of postmenopausal women[4,11], these searches took place mainly in laboratory environments with the use of sophisticated technological resources that limit extrapolation of the results for models of public health intervention, particularly in Basic Health Units (BHU) and the Family Health Units (FHU).

In this context, the objective of this research was to analyze the impact of a physical exercise program adapted to the reality of the Family Health Units (FHU) on the quality of life in women with overweight and obesity in postmenopausal.

METHODOLOGY

This is a descriptive, cross-sectional and of quantitative approach study, embedded in broader research on the effect of exercise on cardiovascular risk factors in women post-menopause period. The sample consisted of women aged 50-87 years old, postmenopausal (no menstruation for at least twelve months), obese (body fat percentage$\geq$ 33%)[12],previously sedentary (<150 minutes per week of moderate or vigorous physical activity in the past six months) all attended at the Family Health Unit (FHU) "Aeroporto" in the city of Marília, São Paulo State. This unit has 786 women aged $\geq$50 years registered. There were selected at random 140 patients to perform home visits and invited to participate in the study.

After the home visit, 94 patients responded positively to the invitation, but only 84 met the inclusion criteria, which are randomly allocated into two groups as follows: 44 patients in the exercise group (Ge) and 38 in the control group (Gc). At the end of the study, ten patients in of Ge and four of Gc were excluded from the study due to incomplete data, low frequency of participation in interventions, surgical procedures and / or illness.

Exclusion criteria were: i) present health problems that limit or impede the completion of the exercise program; ii) has associated with systemic inflammatory responses, such as influenza, diseases, recent surgical procedures, and diseases of the immune system condition; iii) have frequencies below 65% in the proposed interventions; and iv) not undertake all assessment procedures. The Research Ethics Committee of the University of Marilia (UNIMAR) under the n° 364 protocol, approved the execution of this investigation.

To avoid bias in data collection, assessments and surveys were administered by a single evaluator. The prevalence of chronic diseases in the study population was obtained through the questionnaire morbidities, which was supplemented with information on medication use and time without menstruation. The study variables, with the exception of quality of life were measured before and after twenty weeks of intervention.

The percentage of body fat was obtained by bioelectrical impedance method and estimated through specific to postmenopausal women equation[12]. The fat percentage$\geq$33% was used as the cutoff point for obesity as a benchmark of the Brazilian Association for the Study of Obesity and the Metabolic Syndrome[13]. There were held, still, anthropometric measurements of body height and weight, which were used to calculate Body Mass Index (BMI), and waist circumference for determination of central obesity.

Habitual physical activity was estimated by the Baecke questionnaire, in order to confirm the classification of participants as to the level of

physical activity, being considered sedentary participants with <150 minutes per week of moderate or vigorous physical activity in the past six months[14].

The quality of life was assessed by SF-36 (Medical Outcomes Study 36 - Item Short-Form Health Survey), Brazilian version[15], which is characterized as a generic instrument for assessing quality of life. It is a multidimensional questionnaire consisting of 36 items grouped into eight domains (functional capacity, physical, bodily pain, general health, vitality, social functioning, and emotional and mental health issues). For the calculation and interpretation of SF-36 there was used and the steps of calculation Raw Scale scores. The items in each domain were coded and processed on a scale of zero to 100 points, using punctuation and proper interpretation of the scale. Thus, we obtained an average score, with higher scores indicating better health status or QoL, and lower scores, determine the worst health status or impaired QoL[15].

Although the research on which this study has done is inserted before and after intervention measures, the interest in the analysis of the variable quality of life emerged only at the end of the study, i.e., the post-intervention time.

The exercise program was based on recommendations from the American College of Sports Medicine (American College of Sports Medicine - ACSM)[14] this being adapted to the conditions available in Basic Health Units and Family Health, and consisted in offering cardiorespiratory and neuromuscular exercises. This program was implemented at 20 weeks, and their activities were conducted in three weekly sessions of 90 minutes on alternate days, totaling 270 minutes of exercise per week, where each session consisted of the following phases: i) initial (10 minutes) aimed at monitoring reviews and heating ii) main (75 minutes), which includes aerobic (50 minutes) and strength, endurance and muscle stretching (25 minutes) activities, and iii) final (5 minutes), for back to peaceful activities.

Resistance training was performed with isometric and dynamic exercises. The first was run from 4 to 6 exercises in 4 series, with 4 seconds of contraction followed by 10 to 30 seconds of recovery, with the progression of charge every 4 weeks with increased number of years pausing or reduction. 3 to 6 dynamic exercises, run without additional overhead in 4 series of 10 replications of 10 to 30 seconds of recovery, with the progression of charge every 4 weeks by increasing the number of exercises and the pause or reduction were evaluated. The stretching activities were performed in all sessions, and were composed of 6 exercises (2 for the lower limbs, 2 for upper limbs, 1 for the cervical and 1 for lumbar region), being characterized by the maintenance of elongation on the threshold of pain (2 sets of 30 seconds). Activities for the back to calm took place, relaxation massage or cognitive nature activities.

The maximum oxygen consumption ($VO2_{max}$) was estimated by the Protocol of Rockport Walking Institute (walking 1600 meters). Prescription of aerobic work was performed in intensity between 50 and 60% of VO_2 maximum, from which it was determined the speed and distance of walking by the proposed equation in ACSM's Guidelines for Exercise Testing and Prescription[14]. Maximum heart rate (HRmax) was determined for asymptomatic women of 35-85 years old. Each session of aerobic exercise had duration of 50 minutes. During the sessions, heart rate was monitored with the aim of verifying the relationship between $\%VO_2$ maximum and target heart rate zone corresponding training.

The subjects of Gc were instructed to maintain their lifestyle. A meeting with the participants of this group at the beginning and at the end of 20 weeks for evaluation and reevaluation of the variables mentioned above was performed. At the end of that period, were invited to participate in the exercise program.

The data are described as mean, standard deviation (SD), median, minimum (Min) and maximum (Max) for numeric variables and for categorical through the distribution of relative frequency (%) variables. To analyze the association between the group and presence of comorbidities, the chi-square test was performed. The distribution of normality was verified using the Kolmogorov-Smirnov test with correction Lillifors. How the Quality of

Life variable was measured only in the post-intervention comparison between the exercise and control groups was performed by student's t-test for independent samples, or its similar nonparametric Mann-Whitney test, when the assumption of normality does not been served. For all analyzes we used the SPSS software version 19.0 for Windows, with significance level of 5%.

RESULTS AND DISCUSSION

Table 1 presents data on age, time without menstruation and body composition for the exercise and control groups. No significant differences were observed between the groups regarding age and time without periods that might influence the evaluation of the perceived quality of life. However, the exercise group showed BMI, waist circumference and body fat% significantly lower than the control group, confirming the findings of the literature[4,12,16].

The differences between groups in BMI, waist circumference and body fat% can influence the results regarding the assessment of quality of life, particularly given its reflection in functional capacity, physical aspects, pain and vitality. The age of menopause and body weight may influence the intensity of vasomotor symptoms. Furthermore, vasomotor symptoms of menopause are more frequent with increased BMI[7].

Table 1. Comparison between the groups for age, BMI, waist circumference, percent fat and long without menstruation.

	Exercise Group (n=34)		Control Group (n=34)		
	Average ± SD	**Min.-Max.**	**Average±SD**	**Min.-Max.**	**P Value**
Age (years)	63,4±6,9	50-87	63,3±8,8	43-86	0,998
BMI (Kg/m2)	27,5±3,7	21-37	32,6±5,9	22-50	0,0001**
Waist circumference (cm)	84,4±9,8	69-113	95,4±14,5	68-127	0,001*
% Fat	41,8±5,2	33-55	48,1±5,1	38-58	0,0001*
Time without menstruation (years)	12,6±7,3	2-33	16,7±10,1	3-40	0,065

Notes: **significant difference between the averages for the Student's t-test.* **Significance difference between the averages for Mann-Whiteny test.

Table 2 describes the frequency distribution of comorbidities between the groups. There was no significant association between the group and presence of comorbidities. A cross-sectional study conducted in Taiwan, whose sample of 4.437 women aged 35-64 years showed that 846 of these women (19,1%) the variables age, religion, smoking, exercise and comorbidity were independently associated with the presence of menopausal symptoms[17].

Randomized controlled trial conducted in Brazil with 32 sedentary hypertensive patients with a mean age of 55 years old of both genders, who were under pharmacological treatment aimed to evaluate the effect of treatment alone exercise on blood pressure and QoL of hypertensive patients. This study showed that antihypertensive therapy, only through the exercise compared to conventional pharmacological treatment, possible identical BP control and better QoL perception by individuals[18].

Table 3 presents the results for the domains of the SF-36, as well as for general perception of quality of life for the exercise and control groups. In the exercise group was found significantly higher values than the control group for the functional capacity, physical aspects, pain, general health, mental health and overall perception of quality of life.

Although the present study design limitations due to lack of QoL measures in the pre-intervention, allowing detecting possible variations within groups between pre-and post-intervention

groups were similar at the start of the intervention, particularly as the distribution of comorbidities.

Table 2. Distribution of comorbidities among exercise group and control group.

	Exercise Group (n=34)	Control Group (n=34)	P value
HAS	55,9	67,6	0,322
DIS	52,9	41,2	0,335
DM2	11,8	20,6	0,327
OST	14,7	14,7	0,999
ARTHROSIS	8,8	20,6	0,174
ARTHRITIS	26,5	29,4	0,788

Notes: HAS = arterial hypertension; DIS = Dyslipidemia; DM2 = diabetes mellitus II; OST = Osteoporosis; *Significant association between group and presence of comorbidity by the Chi-square test.

Thus, we can infer that differences in QoL between groups are due in large part by the exposure factor, determined in this study by the presence or absence of regular physical exercise. But the fact of the control group presents values of BMI, waist circumference and body fat percentage significantly higher than the exercise group, we can consider these aspects as a possible factor of influence on the QoL domains.

Table 3. Comparison of the values in the Domains of quality of life between the exercise and control groups.

	Exercise Group (n=34)		Control Group (n=34)		P Value
	Median	**Min.-Max.**	**Median**	**Min.-Max.**	
Functional Capacity	93,5	68-98	88,5	23-98	0,023*
Physical Aspects	80,0	20-80	55,0	05-80	0,010*
Pain	71,8	10-98	60,2	18-98	0,003*
General Health	73,8	23-98	58,8	13-85	0,001*
Vitality	83,8	48-93	78,8	04-98	0,252
Social Aspects	98,8	36-98	86,3	23-98	0,054
Emotional Aspects	80,0	13-90	46,7	13-80	0,317
Mental Health	86,8	46-98	82,8	14-98	0,050*
Quality of Life	78,7	57-90	68,1	30-86	0,001*

Notes: Min. = minimum value; Max. = maximum value; *Significant difference between the average for Mann-Whiteny test.

Regular physical activity provides benefits to quality of life at different ages and in different specific population groups[1,11]. Studies that examined the association between exercise and quality of life overall, or effects on specific areas, showed a positive association between the domains and the practice of physical exercise[6,16].

A research showed similar results, with significant improvement in quality of life, except for the pain domain in postmenopausal exposed to 24 weeks of exercise women when compared to the control group[19]. Another study[20]also observed significant improvement in most areas of domains assessment of quality of life of the questionnaire SF-36, except for social aspects and mental health after 16 weeks of walking combined with diet program in post-obese menopause.

These results suggest that longer intervention may interfere with a larger number of areas related to the evaluation of quality of life. However, the practice 30 minutes/day of moderate-intensity physical activity appears to be associated with favorable effects on psychological, social and

environmental fields, but for significant changes in the physical domain are required at least 60 minutes/day, indicating that not only the intervention period, but the total amount of daily physical activity may reflect different impacts on domains of quality of life[16].

It is noteworthy that the results obtained in this study have some limitations. First, the cross-sectional design hampers verify causality. For this reason, longitudinal studies should be conducted in order to obtain further explanation of causality and temporality of the relationship between regular exercise and quality of life in postmenopausal women. So, also other study designs with this population should be encouraged, for example, studies quasi-experimental, pre-test/post-test type and randomized controlled trials. The fact of the variable Quality of Life was measured only in the post-intervention period, restricted the analysis and comparisons of groups for measures that single moment which is a limitation of the study. The SF-36 as a generic instrument for measuring Related Quality of Healthy Life was elected to be employed in the present study due to the fact of being a reliable, tested and validated instrument which has been used in over 1600 publications showing is useful for monitoring general and specific populations. However, with regard to specific features of the disease in question, in this case obesity, SF-36, by its very nature, contemplates important measures as clinical aspects, associated risk factors, medication and adverse effects thereof. Thus, it is suggested that future studies using the SF-36 associated with specific instruments that consider obesity and / or post -menopausal, so consider the above issues.

FINAL CONSIDERATIONS

The health condition is determined by multiple factors and can be monitored by different indicators. Quality of Life has been presented with an important indicator of health condition due to its impact on the autonomy to perform daily activities postmenopausal women.

Although the results do not allow analyzing the impact of the exercise program on quality of life, due to limitations of the study design, we found that the exercise group had better scores in most areas, but also in the overall score on the Quality of Life, suggesting that participation in exercise programs that meet the ACSM promotes effect significant impact on the Quality of Life of postmenopausal women, especially on the domains: functional capacity, physical aspects, pain, general health and mental health.

In the field vitality, in social and emotional aspects were not observed differences between the groups. However it is unclear whether this is related to the parameters adopted by overload exercise program, i.e., these areas are little influenced by the independent exercise intensity, duration or type of exercise.

EFEITOS DA ATIVIDADE FÍSICA NA QUALIDADE DE VIDA DE MULHERES COM SOBREPESO E OBESIDADE PÓS-MENOPAUSA

RESUMO

Este estudo objetivou analisar o impacto de um programa de exercícios físicos adaptado à realidade de Unidades de Saúde da Família (USF) sobre a Qualidade de Vida (QV) de mulheres com sobrepeso e obesidade no período pós-menopausa. Trata-se de pesquisa descritiva, transversal e quantitativa, conduzida em USF de um município do centro-oeste paulista. A amostra por conveniência foi de 68 mulheres com sobrepeso e obesidade na pós-menopausa alocadas igualmente e aleatoriamente em grupo exercício e grupo controle. O programa de exercícios físicos foi estabelecido com base nas recomendações do Colégio Americano de Medicina do Esporte sendo este adaptado às condições disponíveis em USF. Para análise dos dados utilizamos a estatística descritiva e a estatística paramétrica e não paramétrica, com α fixado em 0,05. No grupo exercício foi verificado valores significativamente maiores do que no grupo controle para os domínios capacidade funcional, aspectos físicos, dor, saúde geral, saúde mental e percepção geral de qualidade de vida. A condição de saúde é determinada por múltiplos fatores e pode ser monitorada por diferentes indicadores. A QV tem se apresentado com um importante indicador da condição da saúde devido seu impacto sobre a autonomia para a realização de atividades diárias da mulher pós-menopausa.

Palavras-chave: Mulheres. Menopausa. Exercício. Qualidade de vida.

EFECTOS DE LA ACTIVIDAD FÍSICA EN LA CALIDAD DE VIDA EM MUJERES COM SOBREPESO Y OBESIDAD POS MENOPÁUSICA

RESUMEN

Este estudio tuvo como objetivo analizar el impacto de un programa de ejercicio adaptado a la realidad de las Unidades de Salud de la Familia (USF) acerca de la Calidad de vida (CV) en mujeres con sobrepeso y obesidad en mujeres posmenopáusicas. Se trata de un estudio descriptivo, transversal y cuantitativo realizado en USF en la ciudad del São Paulo. La muestra de conveniencia consistió en 68 mujeres posmenopáusicas con sobrepeso y obesidad por igual y al azar asignados al grupo de ejercicio (Ge) y el grupo control (Gc). El programa de ejercicio se basa en las recomendaciones del Colegio Americano de Medicina del Deporte adaptado a la USF. El análisis de datos utilizó estadística descriptiva, paramétricas y no paramétricas, con α fijado en 0.05. En el Ge fue encontrado dominios significativamente mayores que en el Gc para los dominios: capacidad funcional, aspectos físicos, dolor, salud general, salud mental y la percepción general de la CV. El estado de salud está determinado por múltiples factores y puede ser controlado por diferentes indicadores. La CV ha llevado a cabo un importante indicador del estado de salud debido a su impacto en la autonomía para llevar a cabo las actividades diarias de las mujeres posmenopáusicas.

Palabras clave: Mujeres. Menopausia. Ejercicio. Calidad de vida.

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