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ORIGINAL

TYPES OF PHYSICAL ACTIVITY IN OBESE SENIOR PEOPLE WITH METABOLIC SYNDROME

TIPOS DE ACTIVIDAD FÍSICA EN PERSONAS MAYORES CON OBESIDAD Y SÍNDROME METABÓLICO

Benavente-Marín, J.C.[1]; Pérez-López, J.[2]; Crespo-Oliva, E.[3]; Pérez-Farinós, N.[4]; Barón-López F.J. [5]; Fernández-García, J.C.[6]; Wärnberg, J.[7]

[1] MSc in Physical Activity and Sport Sciences. Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) jc.benaventemarin@uma.es

[2] MSc in Food Science and Technology. Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) jessicaperezlopez@uma.es

[3] MSc in Nursing. Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) edelys@uma.es

[4] MSc in Medicine and Surgery. PhD in Epidemiology and Public Health. Biomedical Research Networking Centre for Physiopathology of Obesity and Nutrition (CIBEROBN). Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) napoleon.perez@uma.es

[5] MSc in Mathematics. PhD in Mathematics. Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) baron@uma.es

[6] MSc in Physical Activity and Sport Sciences. PhD in Pedagogy. Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) jcfg@uma.es

[7] MSc in Nutrition. PhD in Nutritional Medicine. Biomedical Research Networking Centre for Physiopathology of Obesity and Nutrition (CIBEROBN). Biomedical Research Institute of Malaga (IBIMA). University of Malaga (Spain) jwarnberg@uma.es

Spanish-English translator: Rocío Domínguez Castells, rocio@sport-science.net

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ABSTRACT

An active lifestyle can prevent most chronic diseases. The objective of this study is to describe the preferences of types of physical activities in a population with high risk for cardiovascular disease, which will optimize professional advice in similar populations. The sample consisted of 326 senior, obese people with the metabolic syndrome from the PREDIMED-Plus study in Málaga, who at the baseline visit were asked for types of physical activities they performed. The answers were standardized and classified. 47.5% (155) perform brisk walking. After walking, the "Calisthenics, light or moderate effort" is the most frequent type of exercise done. In conclusion people who refer to perform some type of exercise, prefer activities of light intensity to moderate, simple and / or directed by an instructor. Some participants report practicing a more intense and complex physical activity, which may be a feasible recommendation for people with similar characteristics.

KEY WORDS: Physical activity; Physical exercise; Senior people; Obesity; Metabolic syndrome; Exercise preferences; Types of physical activity.

RESUMEN

Un estilo de vida activo puede prevenir la mayoría de enfermedades crónicas. El objetivo de este estudio es conocer las preferencias de tipos de actividad física en una población de alto riesgo cardiovascular, lo que permitirá optimizar el consejo profesional en poblaciones similares. La muestra de estudio está formada por 326 personas mayores, obesas y con síndrome metabólico del estudio PREDIMED-Plus de Málaga, a las que se preguntó en la visita basal qué tipo de ejercicio realizan. Las respuestas se estandarizaron y clasificaron. El 47,5 % (155) realiza caminatas deprisa. Tras la caminata, la "Calistenia, esfuerzo ligero o moderado" es el tipo de ejercicio más referido. En conclusión, las personas que refieren realizar algún tipo de ejercicio prefieren actividades de intensidad ligera a moderada, sencillas y/o dirigidas por un monitor. Algunos participantes refieren practicar ejercicio de mayor intensidad y complejidad, pudiendo ser una recomendación factible para personas de características similares.

PALABRAS CLAVE: Actividad física; Ejercicio físico; Personas mayores; Obesidad; Síndrome metabólico; Preferencias de ejercicio; Tipos de actividad física.

INTRODUCTION

There seems to be increasing evidence that sedentary lifestyle, low physical activity practice levels, low cardiorespiratory fitness level and/or muscle tissue dysfunction (sarcopenia) are the main risk factors for morbimortality in senior people. Therefore, an improvement of these factors may lead to mortality decrease, even more than body weight reduction in people with overweight and obesity, which has other associated risk factors (Barry et al., 2014; Chau et al., 2013; Gaesser, Tucker, Jarrett, & Angadi, 2015; Myers et al., 2002).

For this reason, promoting an active lifestyle is proposed as a fundamental aspect, not only of primary cardiovascular prevention, but also of prevention and treatment of many other pathologies with high prevalence (Pedersen & Saltin, 2015). In fact, positive association has been found between the increase in leisure-time physical activity and the aforementioned risk factors, especially with moderate-to-vigorous-intensity physical activity (Rosique-Esteban et al., 2018). Physical activity practice in the leisure time is related to better self-perceived health levels and lower use of health services in senior people (Lera-López et al., 2017). Even for light-intensity activities, an inverse relationship was found between frequency of practice and probability of presenting depression symptoms, which is considered to be the major cause of disability in the developed world (Medina-Porqueres et al., 2016; Valverde & Guzmán, 2012).

Nevertheless, lack of adherence to the proposed activities to promote an active lifestyle among obese senior people is one of the major limitations (Burgess, Hassmén, & Pumpa, 2017; Molinero, Salguero, & Márquez, 2011). Consequently, adapting the physical activity promotion message to the target population becomes a decisive factor to optimise adherence to an active lifestyle. Therefore, knowing the preferences and the types of exercise already performed by individuals with similar characteristics is a crucial step to an effective message adaptation.

The aim of this study was to classify and describe activities and exercises performed by obese senior people with metabolic syndrome, collected during the first visit to a specialist within a weight-reduction programme. This information will be used to adjust the recommendations to the target population's preferences, therefore increasing their adherence to the intervention.

MATERIAL AND METHOD

STUDY DESIGN AND PARTICIPANTS

This cross-sectional study was conducted with 326 participants of PREDIMED-Plus randomised clinical trial, recruited at the University of Malaga, one of PREDIMED-Plus recruiting centres.

The participants were people with high cardiovascular risk, but with no previous cardiovascular disease, of ages ranging between 55-75 years old in men and 60-75 years old in women, with overweight or obesity (BMI ≥ 27 and < 40 kg/m^2) and at least 3 metabolic syndrome components (Alberti et al., 2009) (elevated blood pressure, elevated fasting glucose, central obesity and/or dyslipidemia). They were recruited and interviewed at Arroyo de la Miel (Benalmádena), Torrequebrada (Benalmádena) and Los Boliches (Fuengirola) primary health care centres, from Costa del Sol Health District, between April 2014 and November 2016. Participation was voluntary, after providing informed consent.

PREDIMED-Plus study was registered on 24th July, 2014 in the International Standard Randomized Controlled Trial registry with number 89898870. The detailed protocol (Martínez-González et al., 2018) can be found at http://predimedplus.com/. The basal data base generated for the study in August 2017 was used.

TYPES OF EXERCISES

Regicor Short Physical Activity Questionnaire, a questionnaire about physical activity performed in leisure time, was administered in an individual interview during the baseline visit of PREDIMED-Plus study. This is a reduced version of Minnesota Leisure-Time Physical Activity Questionnaire (MLTPAQ) (Taylor et al., 1978) validated for REGICOR study (Molina et al., 2017). This questionnaire asks about "Activities performed in a standard month". In particular, it asks how many days per month and how many minutes per day the following activities are performed: walking at three different intensities (brisk walking, walking, cross-country walking), climbing stairs, gardening, and exercise or sports at home, in the gym or outdoors. If participants declared to do exercise or sport at least 1 day a month, they were asked "What type of exercise do you do?" and it was written down. The answer to this last question was open, with a maximum of three different activities and a minimum of zero. Thus, if the interviewees did not declare to do any exercise or sport, it was left blank or it was clearly specified that they did not do any type of exercise.

The number of days that participants did brisk walking, cross-country walking and exercise and sports was analysed, as well as the open answers to the question regarding the type of exercise practised. Brisk walking, cross-country walking and the types of exercise stated were classified according to the Compendium of Physical Activities published by Ainsworth in 2011 (Ainsworth et al., 2011). This compendium is a compilation of specific activities that were studied to determine their mean intensity expressed in METs. Moreover, these activities were coded and grouped in categories, facilitating their study.

The allocation of specific activities to the participants' answers was done by two experts. Firstly, an MSc in Physical Activity and Sport with experience in fieldwork and data collection for PREDIMED-Plus study assigned the compendium's specific activity that was most similar to the participant's answer. Two specific activities were assigned to each of four types of exercise (Brisk walking, Dancing, Stationary bicycling and Tai chi), being left pending of review by another expert. A second expert, with large experience in biomedical research, reviewed the answers to which two specific activities had been assigned. Both experts agreed to leave the two specific activities assigned to the answers Brisk walking, Dancing and Tai chi, and to use the mean intensity of both specific activities in future analyses. The specific activity of Bicycling, stationary bicycle, 30-50 watts, was assigned to the answer Stationary bicycling.

In Ainsworth's 2011 Compendium, Tai chi specific activities belong to the Sports category. Given that the practice of this activity by the study participants was not competitive, but for fitness level maintenance or improvement, the two experts agreed to include this activity in the Conditioning exercise category instead of Sports.

Likewise, they decided not to include in the analyses the types of exercises that were declared to be performed for 0 days and 0 minutes.

A descriptive study was conducted on the frequency with which the participants practised brisk walking, cross-country walking or exercise and sports, as well as on the number of types of exercise declared by those who did some exercise or sport. Frequency and percentage of participants who reported to perform those physical activities at least 1 day per month, 1 day per week or 2 days per week were calculated. The same was done for participants who declared to perform at least 1, 2 or 3 types of exercise. Another descriptive study was carried out on the types of exercise performed, coded according to Ainsworth's 2011 Compendium. Frequency and percentage of specific activities and of categories were calculated, and a ranking was created based on the results of this study.

STUDY VARIABLES

Sociodemographic (sex, age, marital status, educational level, employment status), medical (diagnosed with diabetes, depression), lifestyle (smoking, sedentary lifestyle) and anthropometric variables (height, body weight, BMI, waist circumference), lower-limb muscle strength and adherence to the Mediterranean diet were assessed.

Sociodemographic, medical, lifestyle and adherence to the Mediterranean diet variables were assessed through self-reported questionnaires.

The anthropometric variables were assessed by qualified staff belonging to the fieldwork team of University of Malaga node, composed of nurses and dieticians-nutritionists trained to unify criteria regarding PREDIMED-Plus operating protocol. A SECA stadiometer model 217 was used to determine height. The participant was asked to be barefoot during the measurement and to have their head free of accessories that may alter the result. Both heels were placed together and in contact with the stadiometer's frontal plane, the same as the gluteus and thoracic area. After ensuring that the head was aligned according to Frankfurt plane, the horizontal rod was placed above their head and they were requested to take a deep breath. A SECA scales model 887 was used to measure body weight. After placing the scales on a flat, horizontal, firm surface, the participant was asked to stand on it barefoot, with as few clothes on as possible, to stand in an upright position, looking at the front, not to move, and to place the feet in the middle parallel to each other and the arms extended naturally along the body. A SECA ergonomic measuring tape model 201 was used to measure waist circumference. The participant was asked to remove all clothes from the area to be measured. The circumference was measured at the middle point between the last rib and the upper border of the iliac crest. The participant was requested to stand and breathe normally and the measuring type was placed around them parallel to the floor. BMI was calculated as body weight in kilograms divided by height in square metres.

Lower-limb muscle strength was determined through the validated 30-s chair-stand test (Jones, Rikli, & Beam, 1999), which consists in sitting and standing from a chair as many times as possible in 30 seconds, following an established protocol. This has been considered a test to evaluate performance (Bohannon, 1995) and its validity has been examined (Bohannon, 1995; Jones et al., 1999), showing good reliability (90.2%) in trials with non-institutionalised senior people.

Obesity was defined as BMI ≥30 kg/m^2. Type 2 Diabetes Mellitus was defined as the previous clinical diagnosis of diabetes, HbA1c levels ≥6.5% or the use of anti-diabetic medication at the beginning of the study. Age was divided into two groups (< 65 and ≥ 65 years old).

A descriptive study of the participants was conducted using the variables analysed. Mean and standard deviation were calculated for quantitative variables, while frequency and percentage of the total number of answers were calculated for qualitative variables.

RESULTS

From the 326 participants, 165 (50.6%) were men and 157 (48.2%) were younger than 65 years old. They all had overweight or obesity, a high percentage being diabetic (39.0%), since one of the study inclusion criteria was to meet the MetS conditions and to have a BMI between 27 and 40 kg/m^2. The sample characteristics are described in Table 1.

Table 1. Description of the study participants according to the main variables analysed.

		Men			Women		
	Total	All ages	<65 years	≥65 years	All ages	<65 years	≥65 years
n (% of total)	326	165(50.6)	87(26.7)	78(23.9)	161(49.4)	79(21.5)	91(27.9)
Age (years)	64.8±4.7	64±5.2	59.8±2.8	68.6±2.8	65.6±4.0	61.8±1.5	68.5±2.5
Body weight (kg)	84.5±12.2	90.6±11.0	92.2±11.0	88.7±10.8	78.3±10.0	78.7±9.7	78±10.3
Height (cm)	161.7±8.7	167.8±6.8	168.6±7.1	166.8±6.3	155.4±5.4	156.1±4.9	155±5.7
BMI (kg/m^2)	32.3±3.4	32.2±3.3	32.4±3.3	31.9±3.3	32.4±3.5	32.3±3.8	32.4±3.4
Waist (cm)	105.4±9.2	109.2±8.6	108.9±8.6	109.6±8.7	101.6±8.1	101.5±8.4	101.6±7.9
P17 (points)[a]	9.4±2.6	8.9±2.6	8.9±2.6	8.9±2.5	9.8±2.6	9.6±2.4	10±2.7
Chair-stand test (reps)[b]	10.5±4.9	11.3±5.0	11.4±5.2	11.2±4.9	9.7±4.6	10.2±4.8	9.3±4.5
Sedentary[c]	83(25.5)	49(29.7)	25(28.7)	24(30.8)	34(21.1)	15(21.4)	19(20.9)
Diabetic	127(39.0)	68(41.2)	32(36.8)	36(46.2)	59(36.6)	29(41.4)	30(33.0)
Depression	85(26.1)	15(9.1)	7(8.0)	8(10.3)	70(43.5)	37(52.9)	33(36.3)
Smoker	55(16.9)	33(20.0)	20(23.0)	13(16.7)	22(13.7)	14(20.0)	8(8.8)
Married	226(69.3)	129(78.2)	65(74.7)	64(82.1)	97(60.2)	50(71.4)	47(51.6)
Widow/er	33(10.1)	3(1.8)	2(2.3)	1(1.3)	30(18.6)	9(12.9)	21(23.1)
Primary s.[d]	144(44.2)	63(38.2)	34(39.1)	29(37.2)	81(50.3)	30(42.9)	51(56.1)
Secondary s.[d]	115(35.3)	64(38.8)	35(40.2)	29(37.2)	51(31.7)	23(32.9)	28(30.8)
University s.[d]	58(17.7)	35(21.2)	17(19.5)	18(23.1)	23(14.3)	12(17.1)	11(12.1)
Employed	60(18.4)	45(27.3)	44(50.6)	1(1.3)	15(9.3)	12(17.1)	3(3.3)
Housewife	77(23.6)	1(0.6)	1(1.1)	0(0.0)	76(47.2)	29(41.4)	47(51.6)
Retired	152(46.6)	96(58.2)	21(24.1)	75(96.2)	56(34.8)	17(24.3)	39(42.9)

Quantitative variables are expressed as Mean±Standard deviation and qualitative variables as Frequency (percentage).

[a] P17 (1-17 items): Adherence to the Mediterranean Diet Questionnaire. Maximum score is 17; the higher, the better.

[b] 30-s chair-stand test: repetitions (reps) of sitting-standing from a chair.

[c] Sedentary: sitting for 7 or more hours a day.

[d] s. = studies.

To the question "How many days do you go brisk walking?" 155 participants (47.5%) answered at least 1 day per month, while to the question "How many days do you go cross-country walking or hiking?" 28 participants (8.6%) replied at least 1 day per month. When asked "How many days do you do exercise or sports at home, in the gym or outdoors?", 87 participants (26.7%) declared to do some physical exercise at least 1 day per month. Table 2 shows the results from these questions, as well as the number of types of exercise mentioned by those who did some type of exercise or sport other than walking at least 1 day per month.

Table 2. Frequency of leisure-time moderate-to-vigorous physical activity performance.

	Code[a]	Frequency[b]	Total	Men			Women		
				Total	<65 years	≥65 years	Total	<65 years	≥65 years
		n	326	165	87	78	161	70	91
Moderate/ brisk walking	17190, 17200	≥1 d/m	155(47.5)	82(49.7)	41(47.1)	41(52.6)	73(45.3)	31(44.3)	42(46.2)
		≥1 d/w	130(39.9)	66(40.0)	34(39.1)	32(41.0)	64(39.8)	27(38.6)	37(40.7)
		≥2 d/w	98(30.1)	52(31.5)	29(33.3)	23(29.5)	46(28.6)	18(25.7)	28(30.8)
Cross-country walking	17082	≥1 d/m	28(8.6)	17(10.3)	12(13.8)	5(6.4)	11(6.8)	4(5.7)	7(7.7)
		≥1 d/w	11(3.4)	8(4.8)	6(6.9)	2(2.6)	3(1.9)	1(1.4)	2(2.2)
		≥2 d/w	7(2.1)	5(3.0)	4(4.6)	1(1.3)	2(1.2)	1(1.4)	1(1.1)
Exercise/ Sport	Several codes	≥1 d/m	87(26.7)	36(21.8)	16(18.4)	20825.6)	51(31.7)	20(28.6)	31(34.1)
		≥1 d/w	61(18.7)	27(16.4)	11(12.6)	16(20.5)	34(21.1)	16(22.9)	18(19.8)
		≥2 d/w	36(11.0)	20(12.1)	7(8.0)	13(16.7)	16(9.9)	7(10.0)	9(9.9)
		≥1 type	87(26.7)	36(21.8)	16(18.4)	20(25.6)	51(31.7)	20(28.6)	31(34.1)
		≥2 types	44(13.5)	19(11.5)	8(9.2)	11(14.1)	25(15.5)	13(18.6)	12(13.2)
		3 types	16(4.9)	6(3.6)	4(4.6)	2(2.6)	10(6.2)	6(8.6)	4(4.4)

Results expressed as n(%).

[a] Specific activity code in the Compendium of Physical Activities published by Ainsworth in 2011 (Ainsworth et al., 2011).

[b] Performance frequency of every type of activity (d=days; w=week; m= month) and number of types of exercise/sport mentioned.

After the question "What type of exercise do you do?" 73.3% (239) of the participants declared not to do any type of exercise. 78.2% (129) of men and 68.3% (110) of women did not perform any type of exercise. As regards the age groups, 77.1% (121) of the participants up to 65 years old reported not to do any type of exercise, the same as 69.8% (118) of the participants older than 65.

Table 3 contains the frequency and ranking of the activities performed, according to categories and specific activities, of all activities mentioned and divided by sex and age group. Considering the types of exercise reported by the whole sample, the category order of preference was: Conditioning exercise, Water activities, Dancing, Sports, Bicycling and Running. The five preferred specific activities were: "Calisthenics, light or moderate effort, general (e.g. back exercises), going up and down from floor (150 Taylor Code)", "Weight lifting, various exercises, 8-5 repetitions with variable resistance", "Swimming, vertical floating with feet impulse, moderate effort, general", "Dancing, including Ballroom dance, slow (e.g. waltz, foxtrot, slow dancing, samba, tango, 19th century, mambo, cha-cha) and ethnic dances (e.g. Greek, Middle Eastern, hula, salsa, merengue, bomba and plena, flamenco, belly, swing)" and "Mild stretching".

Table 3. Frequency and ranking of the types of exercise reported by the participants, classified by categories and specific activities.

	Code[a]	Total	Men			Women		
			Total	<65 years	≥65 years	Total	<65 years	≥65 years
Total SA[b]		146	61(41.8)	28(19.2)	33(22.6)	85(58.2)	39(26.7)	46(31.5)
Conditioning exercise		90(61.6)^{1}	40(65.6)^{1}	17(60.7)^{1}	23(69.7)^{1}	50(58.8)^{1}	16(41.0)^{1}	34(73.9)^{1}
Calisthenics, light or moderate effort	2030	25(17.1)^{1}	8(13.1)^{2}	3(10.7)^{2}	5(15.2)^{2}	17(20.0)^{1}	8(20.5)^{2}	9(19.6)^{1}
Weight lifting	2054	16(11.0)^{2}	13(21.3)^{1}	5(17.9)^{1}	8(24.2)^{1}	3(3.5)^{10}	0(0.0)	3(6.5)^{6}
Mild stretching	2101	12(8.2)^{5}	7(11.5)^{3}	3(10.7)^{2}	4(12.1)^{3}	5(5.9)^{7}	1(2.6)^{7}	4(8.7)^{3}
Bicycling. Stationary. 30-50 watts	2011	11(7.5)^{6}	3(4.9)^{7}	2(7.1)^{6}	1(3.0)^{9}	8(9.4)^{4}	1(2.6)^{7}	7(15.2)^{2}
Stair-treadmill ergometer	2048	10(6.8)^{7}	5(8.2)^{4}	2(7.1)^{6}	3(9.1)^{3}	5(5.9)^{7}	3(7.7)^{5}	2(4.3)^{9}
Tai chi. General[c]	15670. 15672	7(4.8)^{9}	1(1.6)^{13}	1(3.6)^{9}	0(0.0)	6(7.1)^{6}	2(5.1)^{6}	4(8.7)^{3}
Yoga. Hatha	2150	4(2.7)^{11}	0(0.0)	0(0.0)	0(0.0)	4(4.7)^{9}	1(2.6)^{7}	3(6.5)^{6}
Pilates. General	2105	3(2.0)^{12}	1(1.6)^{13}	1(3.6)^{9}	0(0.0)	2(2.4)^{11}	0(0.0)	2(4.3)^{9}
Bicycling. RPM/Spinning	2019	2(1.4)^{16}	2(3.3)^{10}	0(0.0)	2(6.1)^{6}	0(0.0)	0(0.0)	0(0.0)
Water activities		24(16.4)^{2}	4(6.6)^{4}	1(3.6)^{5}	3(9.1)^{2}	20(23.5)^{2}	14(35.9)^{2}	6(13.0)^{2}
Swimming. Moderate effort	18350	15(10.3)^{3}	3(4.9)^{7}	1(3.6)^{9}	2(6.1)^{6}	12(14.1)^{2}	10(25.6)^{1}	2(4.3)^{9}
Water aerobics	18355	9(6.2)^{8}	1(1.6)^{13}	0(0.0)	1(3.0)^{9}	8(9.4)^{4}	4(10.3)^{4}	4(8.7)^{3}
Dancing		16(11.0)^{3}	4(6.6)^{4}	3(10.7)^{2}	1(3.0)^{5}	12(14.1)^{3}	9(23.1)^{3}	3(6.5)^{3}
Dancing. General[d]	3040 3025	15(10.3)^{3}	4(6.6)^{6}	3(10.7)^{2}	1(3.0)^{9}	11(12.9)^{3}	8(20.5)^{2}	3(6.5)^{6}
Aerobic. General	3015	1(0.7)^{18}	0(0.0)	0(0.0)	0(0.0)	1(1.2)^{12}	1(2.6)^{7}	0(0.0)
Sports		8(5.5)^{4}	6(9.8)^{2}	3(10.7)^{2}	3(9.1)^{2}	2(2.4)^{4}	0(0.0)	2(4.3)^{4}
Golf	15290	3(2.0)^{12}	2(3.3)^{10}	0(0.0)	2(6.1)^{6}	1(1.2)^{12}	0(0.0)	1(2.2)^{12}
Tennis. General	15675	3(2.0)^{12}	3(4.9)^{7}	2(7.1)^{6}	1(3.0)^{9}	0(0.0)	0(0.0)	0(0.0)
Badminton. Doubles and singles	15030	1(0.7)^{18}	0(0.0)	0(0.0)	0(0.0)	1(1.2)^{12}	0(0.0)	1(2.2)^{12}
American football or Baseball	15235	1(0.7)^{18}	1(1.6)^{13}	1(3.6)^{9}	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Bicycling		6(4.1)^{5}	5(8.2)^{3}	3(10.7)^{2}	2(6.1)^{2}	1(1.2)^{5}	0(0.0)	1(2.2)^{5}

Bicycling. <16 km/h	1010	6(4.1)[10]	5(8.2)[4]	3(10.7)[2]	2(6.1)[5]	1(1.2)[12]	0(0.0)	1(2.2)[12]
Racing		2(1.4)[6]	2(3.3)[6]	1(3.6)[5]	1(3.0)[5]	0(0.0)	0(0.0)	0(0.0)
Jog/walk combination	12010	2(1.4)[16]	2(3.3)[10]	1(3.6)[9]	1(3.0)[9]	0(0.0)	0(0.0)	0(0.0)

Results expressed as % (n) [n], [n] being the place in the ranking of every category or specific activity, within each subgroup analysed.

[a] Specific activity code in the Compendium of Physical Activities published by Ainsworth in 2011 (12).

[b] Total specific activities, by sex and age group.

[c] Tai Chi practice has been grouped under “Tai Chi, qi gong, general” (15670) and “Tai Chi, qi gong, sitting, light effort” (15672) and it has been placed under Conditioning exercise category.

[d] Dancing practice has been grouped under “Ballroom dance, slow (e.g. waltz, foxtrot, slow dancing, samba, tango, 19th century, mambo, cha-cha)” (03040) and “Ethnic dances (e.g. Greek, Middle Eastern, hula, salsa, merengue, bomba and plena, flamenco, belly, swing)” (03025).

DISCUSSION

The study participants who declared to perform some type of exercise preferred light-to-moderate-intensity activities, with large aerobic component, easy to perform or in group lessons guided by an instructor.

In spite of the above, several participants reported to prefer activities of higher intensity and complexity, like strength training or weight lifting. This type of exercise is an excellent candidate to be included in the physical activity recommendations to obese senior people with metabolic syndrome, overcoming specific individual impediments through individualised advice provided by competent practitioners. In fact, when physical exercise is correctly programmed and adapted to the target population by a competent practitioner, positive and significantly relevant results are observed in perceived health and quality of life of sedentary adults, compared to medical advice and monitoring or to absence of intervention (Del Valle Soto, Prieto Saborit, Nistal Hernández, Martínez Suárez & Ruiz Fernández, 2016).

There are noteworthy differences among the subgroups analysed, e.g. men preferred non-guided activities that they could perform with no company. Women are more prone to group activities guided by an instructor. This could be partially explained by women’s greater time flexibility to adapt to guided lesson schedules, since a little percentage of them declared to work out of home, apart from other more complex sociocultural aspects.

In light of the worrying results of the 30-s chair-stand test, it is worth mentioning the low preference for moderate-to-vigorous-intensity conditioning activities and for muscle function improvement activities. These activities could produce the largest health improvements (Rosique-Esteban et al., 2017). Despite “Weight lifting, various exercises, 8-15 repetitions with variable resistance” being the second most practised specific activity in the whole sample and the second in the men subgroup, it was only mentioned by 4.9% (16) of all participants, 7.8% (13) of men and 1.9% (3) of women.

Any type and intensity of physical activity can be beneficial for health. However, according to WHO Global Recommendations on Physical Activity for Health («WHO | Physical Activity», 2010) and the Physical Activity Guidelines for Americans (Piercy et al., 2018), these benefits could be optimised through both cardiorespiratory endurance and muscle-strengthening exercises of higher intensity (Shiroma et al., 2017). Lower-intensity physical activity could be left for daily-life activities that involve movement, leading to a reduction of the sedentary lifestyle rate among this population. Actually, previous results in a similar population (Rosique-Esteban et al., 2017) suggested that spending longer time on moderate-to-vigorous physical activity and shorter time on sedentary behaviours is inversely related to obesity, Type 2 Diabetes Miellitus and some components of the metabolic syndrome.

Almost three quarters (73.3%) of the participants did not perform any exercise other than walking, which was done at least 2 times a week by less than a third (30.1%) of the study sample. These data reveal a concerning lack of physical exercise in an obese population with high cardiovascular risk and metabolic syndrome. It is a public health priority to reduce this lack of body movement, especially of moderate-to-vigorous intensity, in a population that is so susceptible to suffering from serious health problems, which are costly for the health system.

The use of self-reported questionnaires could be a limitation for consistent interpretation of these results, since they could be biased by socially desirable answers. Nevertheless, the practical application of the results is perfectly valid, as the main aim of this research was to gain knowledge on the activities performed by obese senior people with metabolic syndrome in order to optimise the physical exercise recommendations provided by practitioners who work with similar populations. Furthermore, this bias would overestimate participants' physical activity performance, so if it was controlled, the results that showed lack of physical activity in the study sample would be even more evident.

CONCLUSIONS

The results revealed a lack of physical exercise practice in the population under study. Moreover, those who declared to perform some type of exercise chose light-to-moderate-intensity activities, the most popular being walking, calisthenics, weight lifting, swimming, dancing and stretching. They produce a limited health improvement compared to higher-intensity activities.

Therefore, better education on physical activity and exercise is needed in senior adults in order to make their preferences closer to WHO Global Recommendations on Physical Activity for Health. To this end, it is necessary to enhance this population's trust on moderate-to-vigorous-intensity and muscle-strengthening activities.

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