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CONTROLO DA PRESSÃO ARTERIAL EM MULHERES IDOSAS MEDICADAS: BENEFÍCIOS DO PROGRAMA DE EXERCÍCIO FÍSICO FUNCIONAL

BLOOD PRESSURE CONTROL IN ELDERLY MEDICATED WOMEN: BENEFITS OF A PHYSICAL FUNCTIONAL EXERCISE PROGRAMME

CONTROL DE LA PRESIÓN ARTERIAL EN LAS MUJERES DE EDAD AVANZADA MEDICADAS: BENEFICIOS DEL PROGRAMA DE EJERCICIO FÍSICO FUNCIONAL

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RESUMO

Introdução: A atividade física é recomendada para a prevenção e tratamento da hipertensão. A abordagem da intervenção promotora da atividade física funcional em um grupo de idosas hipertensas, deve ser caracterizada por uma intervenção holística face à pessoa. Esta consiste em considerar a pessoa na sua integridade física, psíquica e social.
Objetivo: Avaliar o efeito da implementação de um programa de treino funcional sobre a pressão arterial em repouso em mulheres idosas hipertensas, submetidas ao treino de exercício físico durante um período de 24 meses.
Métodos: Pesquisa exploratória, com orientação analítico-descritiva com a finalidade de analisar a ação da atividade física direcionada e implementada três vezes por semana no prognóstico da hipertensão arterial. Esta pesquisa foi suportada na recolha de dados da pressão arterial em repouso numa amostra de 60 idosas brasileiras na faixa etária de 60 a 90 anos da comunidade do Vergel do Lago, Maceió/AL, Brasil.
Resultados: A maioria das idosas é hipertensa (80%), constatando-se que durante o período de treino apresentaram pressão arterial sistólica e diastólica muito abaixo do padrão da normalidade para essa faixa etária.
Conclusões: Após a intervenção do *Projeto Prevenção de Saúde Estádio Vivo*, as idosas apresentaram redução e melhor controle dos valores da sua pressão arterial. Considera-se assim, que o treino físico ao exercer um efeito fisiológico específico ao nível muscular e cárdio-circulatório é protetor do estado de saúde pelo que deve ser incentivado ao longo de todo o ciclo vital. Infere-se também que o Programa implementado pode ser replicado como medida de educação terapêutica, de avaliação e de auditoria de boas práticas em saúde.

Palavras Chave: Idoso; Atividade física; Hipertensão; Envelhecimento.

ABSTRACT

Introduction: Physical activity is recommended for the prevention and treatment of hypertension. The approach of promoting functional physical activity in a group of hypertensive elderly women should be characterized by a holistic intervention on the person. This consists in considering the whole person in terms of their physical, psychic and social selves.
Objective: To evaluate the effect of implement a functional training programme on resting blood pressure in hypertensive elderly women, submitted to exercise training over a period of 24 months.
Methods: Exploratory research, with descriptive-analytical orientation to analyse the action of directed physical activity, implemented three times a week on the prognosis of arterial hypertension. This research was supported by the blood pressure data collection at rest in a sample of 60 Brazilian elderly women in the age group of 60 to 90 years, in the community of Vergel do Lago, Maceió / AL, Brazil.
Results: The majority (80%) was elderly and hypertensive, having noticed that during the training period they had a systolic and diastolic blood pressure well below the normal standard for this age group.
Conclusions: After the intervention of the *Vivo Stadium Health Prevention Project*, the elderly women showed a reduction and better control of blood pressure values. The results suggest that in inducing a specific physiological effect exerted at the muscle and cardio-circulatory level, physical training protects the state of health, indicating that it should be encouraged throughout the lifecycle. It can also be inferred that the programme implemented can be replicated as a measure of therapeutic education, assessment and audit of good health practices.

Keywords: Elderly Person; Physical Activity; Hypertension; Aging.

RESUMEN

Introducción: La actividad física es recomendada para la prevención y tratamiento de la hipertensión. El abordaje de la intervención promotora de la actividad física funcional en un grupo de ancianos hipertensos, debe ser caracterizada por un enfoque holístico de la persona. Esta consiste en considerar a la persona en su integridad física, psíquica y social.
Objetivo: Evaluar el efecto de la implementación de un programa de entrenamiento funcional sobre la presión arterial en reposo en mujeres ancianas hipertensas, sometidas al entrenamiento de ejercicio físico durante un período de 24 meses.
Métodos: Investigación exploratoria, con orientación analítico-descriptiva con la finalidad de analizar la acción de la actividad física dirigida e implementada tres veces por semana en el pronóstico de la hipertensión arterial. Esta investigación fue apoyada en la recogida de datos de la presión arterial en reposo en una muestra de 60 ancianas brasileñas en el grupo de edad de 60 a 90 años, de la comunidad del Vergel del Lago, Maceió / AL, Brasil, en condiciones de excelente motivación por parte del grupo.

Resultados: La mayoría de las ancianas era hipertensa (80%), constatando que durante el período de entrenamiento presentaron presión arterial sistólica y diastólica muy por debajo del patrón de la normalidad para ese grupo de edad.
Conclusiones: Después de la intervención del *Proyecto Prevención de Salud Estadio* Vivo las ancianas presentaron reducción y mejor control de los valores de su presión arterial. Se considera así que el entrenamiento físico al ejercer un efecto fisiológico específico al nivel muscular y cardio-circulatorio es protector del estado de salud por lo que debe ser incentivado a lo largo de todo el ciclo vital. Se infiere también que el Programa implementado puede ser replicado como medida de educación terapéutica, de evaluación y de auditoría de buenas prácticas en salud.

Palabras Clave: Ancianos; Actividad física; hipertensión; Envejecimiento.

INTRODUCTION

High blood pressure (HBP) or hypertension (HTN) is a disease which affects almost 25% of the world's population. It affects mainly adults with a low percentage of them revealing proper control of this clinical parameter. This requires a close attention to blood pressure levels as a way to prevent all cardiovascular diseases. HBP diagnosis is defined as the persistent increase, in different measurements and on different occasions, in systolic blood pressure (SBP) equal to or greater than 140 mmHg and/or in diastolic blood pressure (DBP) equal to or greater than 90 mmHg. (Direção Geral da Saúde, Portugal, 2013). This condition can be classified into three major categories or levels: class 1 corresponds to mild high blood pressure, class 2 to moderate high blood pressure and class 3 to severe high blood (Direção Geral da Saúde, Portugal, 2013). It is an asymptomatic disease for which morbidity and mortality are manifest by degeneration of blood vessels, the myocardium, glomeruli and retinal disease. These lesions are caused by chronically high pressure exerted on the blood vessels which predispose the patient to clinically relevant cardiovascular events encephalic vascular accident, severe myocardial infarction, peripheral vascular insufficiency, more severe retinal injuries such as exudates, bleeding and swelling of the optic disc(Silva, Martins, Carlos, Silva & Veloso, 2012).

Although a knowledgeable reader in the area of health may be considered to understand the differentiated use of the terms arterial pressure and hypertension according to the focus of the research and the contexts of the analysis of the study, we would like to clarify them thusly: – blood pressure is the "pressure of the blood in the arteries. It is commonly measured in the upper arm with a sphygmomanometer, representing the arterial pressure in the brachial artery" (DeCS, 2018); – hypertension is "persistently high systemic blood pressure. Based on various measurements (blood pressure determination), hypertension is currently defined as having systolic pressure repeatedly over 140 mm/Hg or s diastolic pressure of 90 mm/Hg or higher. Synonyms – High Arterial Pressure; High Blood Pressure" (DeCS, 2018).

Blood pressure (BP) varies according to daily activities and there are many variability factors: room temperature, time of day or year, meals, physical activity, posture, smoking habits, emotions and above all stemming from repeated lifestyle errors. Among these, we highlight the regular practice of a physical activity, as a non-pharmacological means capable of reducing blood pressure significantly. The exercise to be undertaken should comprise cyclical movements such as walking, running, swimming, or dancing. However, hypertensives should avoid intense efforts such as lifting weights or moving heavy furniture, which can sometimes increase blood pressure (Carrageta, 2006).

With this problem in mind, healthcare workers should understand that high blood pressure is a public health concern that has to be controlled without exception in the general population, in order to substantially modify populations' health indicators.

Several risk factors such as age, race, obesity, smoking habits, diabetes mellitus and dyslipidaemia, and a sedentary lifestyle are directly associated with high blood pressure. (Radovanovic, Santos, Carvalho, Marcon, 2014)

Through the *European Society of Hypertension e da European Society of Cardiology* (2013) recommendations, Perk, De Backer, Gohlke, Graham, Reiner, Verschuren, Albus, Benlian, Boysen, Cifkova, Deaton, Ebrahim, Fisher, Germano, Hobbs, Hoes, Karadeniz, Mezzani, Prescott, Ryden, Scherer, Syvänne, Scholte op Reimer, Vrints, Wood, Zamorano & Zannad, (2012) stress that the primary aim of treatin hypertensive patients is to reach a long-term maximum reduction in morbidity and mortality rates. Therefore, although HBP is often treated on its own, it is urgent to identify and treat all the reversible risk factors like smoking, dyslipidaemia and diabetes. Taking into account all the evidence that indicates that HBP represents one of the most relevant risk factors in the aetiology of cerebrovascular and cardiovascular diseases and is a major cause of cardiovascular morbidity and mortality, prevention and proper treatment are key factors in the therapeutic attitude towards this (Direção Geral da Saúde, Portugal, 2013).

The *American Heart Association & American Stroke Association* (2014, p. 4) stresses that the focus on prevention should

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be centred on three major actions: *checking, changing* and *controlling.*

With the aging process comes physiological and functional changes that are part of this phase of human life and that make elderly people more vulnerable to chronic diseases, including high blood pressure. Besides age, excess weight is clearly a factor that affects the normal functioning of the circulatory system, allowing HBP to develop, increasing the risk of cardiovascular diseases and diabetes (Malta, Scala & Fuchs, 2017).

A sedentary lifestyle also increases the risk of HBP appearance. That is why physical exercise is a condition that brings great benefits to people's heart and circulatory system and helps control blood pressure. Lifestyle is also an important factor in everyone's lives, but mainly on elderly people's lives: the consequences of a lifestyle that follows risk behaviours is a huge concern since HBP complications tend to increase with age (Malta, Scala & Fuchs, 2017). The authors also report that obese people, with a BMI (Body Mass Index) >30, are up to 6 times more likely to have HBP when compared to people with a BMI <25. The sedentary lifestyle also increases the risk of the onset of hypertension. Therefore, practicing physical activity is a condition that results in great benefits to the heart and the circulatory system in general, helping to control blood pressure. Lifestyle is also an important factor in the specific case of the elderly. The consequences of a lifestyle based on risk behaviours is a major concern because the complications of hypertension tend to increase with age (Malta, Scala & Fuchs, 2017).

Hypertensive patients' medicinal therapy must be based on pharmacological studies, on the one hand, and on each person's individual profile, on the other. Healthcare workers must then act as mediators who have to conjugate pharmacological and non-pharmacological interventions. Non-pharmacological interventions are important to control risk factors since they is associated with changes in lifestyles and are a way to prevent or stop the evolution of high blood pressure. In this context, non-pharmacological treatments are an essential part of treating patients with HBP. The protective effect of the functional physical activity, in addition to reducing BP, is associated with reducing cardiovascular risk factors and with decreased morbidity and mortality. This justifies the idea that physical exercise should be recommended to help achieve primary prevention and to treat HBP (Nogueira, Santos Mont´Alverne, Martins & Magalhães, 2012). According to these authors, functional physical activity has been considered as one of the main therapeutic strategies in patients with HBP. Its synergetic effect associated with the pharmacological treatment and with changes in eating and behavioural habits is an added value that has to be developed and implemented in a dynamic way in conjunction with the different chronological stages of human development.

HBP is currently a risk factor prevalent in different populations and, consequently, this nosological entity *lacks early* and proper differential diagnosis and ongoing monitoring. So, it is very important that patients do not interrupt the triple therapy (pharmacological treatment, physical activity and eating habits) since this interruption is likely to cause a worsening of their clinical situation, although HBP may evolve in a benign manner in a significant number of cases and may be controlled with medication.

With this in mind, the aim of this study is to confirm if the practice of functional physical activity, performed three times a week, consisting of 40 minute walks, helps to reduce resting BP in elderly hypertensive women who are being medically controlled.

1. METHODS

The objective of this exploratory descriptive study was to analyse the influence of directed physical activity carried out three times a week on diagnosis of HBP. This research was backed by the BP data collected at rest from a sample elderly Brazilian women aged between 60 and 90. The 60 elderly women were arranged into three age groups: 60-70, 71-80 and 81 years or older, with the majority aged 60-70 years (65.0%).

The main aim was to check the effects the functional practice of the exercise of walking on resting BP in elderly hypertensive women who were being medically controlled and who were between 60 and 90 years old. The women's BP was being controlled with anti-hypertensive medication, during a 24-month period. The patients were part of a functional exercise practice group. Our specific aim was to assess resting BP at the beginning of the physical activity and 2 years after the practice of physical exercise had begun, as well as to evaluate the elderly women's health profile.

Participants

The "*Prevenção de Saúde Estádio Vivo*" Project was carried out at the "*Estádio Rei Pelé*" in the Maceió municipality, in Brazil, and involved the population from the Vergel do Lago quarter and its surroundings, an area which has seen considerable growth in recent years as a consequence of building of new housing estates. Nevertheless, new shacks have continued to appear giving rise to new "favelas" or slums. This situation led to the development of public policies to promote health by preventing diseases and developing strategies that would improve quality of life and have a social

impact on the lives of people living in extreme poverty.

Intervention/Research/Programme/Measurement Protocol

Criteria for inclusion and exclusion: Age equal to or greater than 60 years; medical diagnosis of hypertension; undergoing medical treatment with prescribed medication; not having a history of another chronic disease.

The two-year (24 months) intervention programme included assessments every 6 months.

Physical exercise consisted of walking in the park three times a week for forty minutes with a break every twelve (12) uninterrupted minutes.

The hypertensive elderly women accepted the physical assessment of their physiological and cardiorespiratory functions with a maximum VO^2 test 12 minutes after walking in order to test their aerobic resistance. In this study only blood pressure is reported.

Socio-demographic data and the assessed health parameters were collected using an ad hoc form created for this purpose.

Blood Pressure Reference Values

The BP values were classified according to Norm No. 2/DGCG of 31/03/04 as proposed by the World Health Organization (WHO) in 2003) (see Table 1).

Table 1. Classification of the Blood Pressure.

The recommendations of Portuguese Norm No. 2/DGCG of 31/03/04, backed by the classification suggested by WHO (2003), which defines the following cut-off points:			
Classification	**Systolic BP**		**Diastolic BP**
Hypotension	≤119	and	≤79
Normal	120-129	and	80-84
High	130-139	or	85-89
Hypertension level I	140-159	or	90-99
Hypertension level II	≥ 160	or	≥ 100

Statistical and ethical-legal procedures

In the data analysis, descriptive statistics were used for the sociodemographic characterization and health parameters and the Friedman test was used for the inferential analysis in paired samples.

The choice to use this type of test was due to the fact that the variable in question did not present a normal distribution.

The development of the study followed the ethical-legal requirements of respect for self-determination and autonomy of the subjects, so that the elderly women's participation in this study was voluntary as they took part in the training programme after being informed regarding the project, they signed the consent form freely.

2. FINDINGS

During the two-year period, the group continued to take the same medication as before the study. The only change introduced was their physical activity (walking).

Table 2 shows the medication taken by each elderly woman and their respective blood pressure values in the four assessments, showing decreased BP values. In the four evaluations, the maximum value was 170/110 observed in the first (1st) evaluation, and the minimum value was 100/50 measured in the fourth (4th) and final evaluation (cf. Table 2).

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Table 2. Frequency of elderly women's BP level.

Participants	Medication	1st BP April 2012 121/140 – 90 mmhg	2nd BP Oct.2012 12/80 mmhg	3rd BP April 2013 12/80mmhg	4th BP Oct. 2013 110/60 mmhg
1	Atenolol 25 mg	140/90 mmhg	12/80 mmhg	12/80 mmhg	11/60 mmhg
2	Captopril 50 mg	140/80mmhg	11/70mmhg	12/80	100/50
3	Captopril 25 + 25	160/90mmhg	130/80mmhg	130/70	110/70
4	Aradois 50	170/90mmhg	140/80mmhg	110/70	120/80
5	Pressat 25 mg	160/80	130/70	120/80	110/70
6	Losartana 50	150/80	130/80	130/70	120/70
7	Clorotiazida	150/70	140/80	120/80	120/80
8	Clorotiazida	170/80	150/80	140/80	120/90
9	Adalat 25	115/70	120/80	115/75	136/85
10	Clorotiazida 50	155/80	145/85	130/80	120/80
11	Clorotiazida 25	160/95	150/80	140/80	130/80
12	Adalat 25	150/90	150/80	130/80	120/80
13	Clorotiazida 50	140/80	130/80	120/80	120/75
14	Adalat 50	140/80	120/80	130/80	110/60
15	Aradois 50	140/10	130/90	120/90	120/80
16	Abloc 50	140/90	120/75	120/70	110/65
17	Atenoresi 50	150/10	120/80	110/70	120/70
18	Captopril 25	140/10	130/70	120/70	110/60
19	Adalat 25	130/90	120/80	110/60	100/60
20	Clorotiazida 50	135/10	120/75	110/60	110/60
21	Atenol 25	140/90	120/80	110/70	110/70
22	Atenol 50	160/80	140/80	130/90	110/80
23	Losartana 50	150/70	130/80	130/90	110/80
24	Aradois 25	150/90	120/80	120/70	110/70
25	Abloc 25	170/11	140/80	120/80	120/80
26	Aradois 50	150/10	140/80	130/90	120/80
27	Clorotiazida 50	140/90	130/80	130/80	110/70
28	Adalat 25	130/80	120/80	120/80	110/60
29	Losartana 25	170/80	120/70	120/70	110/70
30	Aradois 50	160/75	130/70	110/70	110/60
31	Losartana 25	170/80	120/70	130/70	110/70
32	Aradois 25	140/100	130/70	110/60	110/60
33	Anenoto 25	140/90	130/80	120/80	120/80
34	Abloc 50	170/11	140/80	120/80	120/70
35	Atenol 25	130/80	120/80	110/60	120/70
36	Pressat 25	140/50	120/80	120/80	120/80
37	Clorotiazida 25	140/80	130/85	120/80	115/60
38	Losartana 25	160/80	140/90	110/70	110/60
39	Aradois 50	140/90	130/80	120/70	110/60
40	Clorotiazida 25	130/90	120/70	110/70	110/60
41	Aradois	150/10	130/80	130/70	120/70
42	Losartana	140/80	130/80	113/70	120/70
43	Aradois	130/70	120/80	120/70	110/60
44	Adalat	130/70	120/80	110/70	120/60
45	Losartana	140/70	115/90	120/70	110/60
46	Captopril	160/80	130/70	120/80	120/80
47	Captopril	150/80	130/80	130/70	110/70
48	Pressat	150/70	130/80	130/90	110/80
49	Adalat	160/75	130/70	110/70	110/60
50	Aradois	140/100	130/70	110/60	110/60
51	Clorotiazida	130/80	120/80	110/60	120/70
52	Clorotiazida	115/70	120/80	115/75	136/85
53	Captropil	140/100	130/70	110/60	110/60
54	Captropil	150/80	130/80	130/70	120/80
55	Losartana	150/70	140/80	120/80	120/80
56	Losartana	130/70	120/80	110/70	120/60
57	Adalat	140/90	120/80	120/80	110/60
58	Pressat	130/80	120/80	110/60	120/70
59	Pressat	150/80	130/80	130/70	110/70
60	Captopril	160/80	130/70	120/80	120/80

The participants showed a rather significant reduction in their systolic and diastolic BP during the resting period that happened between the days on which they performed their physical activity (Table 3). They felt motivated to interrupt the use of their respective medications; however, no resolution from the medical clinic was obtained, making evaluation of such a possibility impossible to carry out in th is study. Nevertheless, it was possible to diagnose the significant reduction in resting BP through the practice of physical activity.

The statistics of the mean systolic BP values reveal that, during the first assessment, those were significantly higher and that they went on decreasing during the next three assessments and reached their lowest value during the fourth assessment. As far as the mean values of the diastolic BP are concerned, we saw that, on the first evaluation, those values were significantly higher than in the other three evaluations where a decrease can be observed. The values recorded during the fourth evaluation were the lowest. We confirmed that there are statistically significant differences between the moments in which assessment was performed regarding both the systolic BP and the diastolic BP ($p<0.05$) (cf. Table 3).

Table 3. Statistics regarding mean systolic and diastolic BP values.

BP	n	Min	Max	M	DP	$Sk/_{error}$	$K/_{error}$	CV (%)	Kolmogorov-Smirnov	p
Systolic BP										
1st Evaluation	60	115	170	146.00	13.366	0.17	-0.53	9.15	.190	0.004
2nd Evaluation		110	150	128.33	9.098	2.01	-0.72	7.08	.227	0.000
3rd Evaluation		110	140	120.05	8.335	1.25	6.94	-1.09	.219	0.000
4th Evaluation		100	136	115.12	7.018	2.23	2.02	6.09	.284	0.000
Diastolic BP										
1st Evaluation	60	50	110	84.08	11.553	0.05	0.47	13.74	.221	0.001
2nd Evaluation		70	90	78.33	5.098	-0.88	-0.71	6.50	.378	0.000
3rd Evaluation		60	90	74.00	8.224	0.15	10.42	11.11	.220	0.000
4th Evaluation		50	90	70.00	9.206	0.27	-1.78	13.15	.211	0.000

The prevalence of women who show Level I Hypertension in the first evaluation was 45%, followed by those who had Level II Hypertension (40.0%). In the second evaluation, we could see that the highest percentage was women with normal high blood pressure (38.3%), followed by those who showed normal blood pressure (36.7%). Level I Hypertension cases (23.3%) decreased considerably and there was no evidence of patients with Level II high blood pressure. This decrease in BP values is even more evident in the third and fourth evaluations: in the third, the percentage of women with hypotension increased (33.3%) and the percentage of patients with normal blood pressure (36.7%) should be stressed. In the fourth evaluation, the percentage of participants with hypotension increased (48.3%), as well as for those who showed normal blood pressure (46.7%). There was no evidence of Level I or Level II Hypertension. Thus, we witnessed we found hypertension had been controlled (see table 4).

Table 4. Classification of the BP values in each evaluation moment.

Blood Pressure The recommendations of "Portuguese Norm No. 2/DGCG of 31/03/04 which defines the following cut-off points were adopted:					**1st Evaluation**		**2nd Evaluation**		**3rd Evaluation**		**4th Evaluation**	
	Systolic BP		**Diastolic BP**	**Classification**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
BP	**≤119**	and	**≤79**	Hypotension	2	3.3	1	1.7	20	33.3	29	48.3
	120-129	And	80-84	Normal	-	-	22	36.7	22	36.7	28	46.7
	130-139	Or	85-89	Normal high	7	11.7	23	38.3	11	18.3	3	5.0
	140-159	Or	90-99	Level 1Hypertension	27	45.0	14	23.3	7	11.7	-	-
	≥ 160	Or	≥ 100	Level 2 Hypertension	24	40.0	-	-	-	-	-	-
				Total	**60**	**100.00**	**60**	**100.00**	**60**	**100.00**	**60**	**100.00**

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Analysis of the Friedman test for the blood pressure values according to the evaluation moment show that there are statistically significant differences. We may conclude that in the first evaluation the systolic BP values were significantly higher and that they were lower in the fourth evaluation (Table 5).

Table 5. Friedman test results for BP values according to the moment of the evaluation.

BP	Evaluation	*n*	Mean *x*	Std. Deviation *DP*	Friedman Test Mean Rank	Chi-Square	df	p
Systolic Blood Pressure	1st systolic BP evaluation 1	60	146.00	13.366	3.91	136.877	3	0.000
	2nd systolic BP evaluation 2	60	128.33	9.098	2.74			
	3rd systolic BP evaluation 3	60	120.05	8.335	1.90			
	4th systolic BP evaluation 4	60	115.12	7.018	1.45			
Diastolic Blood Pressure	1st diastolic BP evaluation 1	60	84.08	11.553	3.23	57.253	3	0.000
	2nd diastolic BP evaluation 2	60	78.33	5.098	2.81			
	3rd diastolic BP evaluation 3	60	74.00	8.224	2.22			
	4th diastolic BP evaluation 4	60	70.00	9.206	1.24			

3. DISCUSSION

The results of this study show that, with the implementation of the programme, there was in general a decrease in the BP values. The elderly participants showed a quite significant reduction in their systolic and diastolic BP during a resting period between the days in which they had to follow their physical training. The fourth evaluation showed a dramatic reduction in systolic and diastolic BP values. These results are in line with those found by Nogueira et al. (2012 where changes in systolic and diastolic BP values were compared among the groups of elderly patients with HBP, who were part of a physical activity programme. A statistically significant decrease in all of the variables was obtained. Thus, the results suggest that functional physical activity is an efficient tool in the treatment of hypertensive elderly people. Those authors mention that cardiovascular endurance training benefits the presence or absence of beta-blockers and a marked improvement in the endothelial function. However, they caution that the training heart rate of people with HBP who use beta-blockers is about 20% lower than those who do not use them.

Similarly, based on their study, Medina et al. (2010), have observed that aerobic training reduces hypertensive patients' clinical systolic/diastolic BP by about 7/5 mmHg. From this perspective, the authors recommend the practice of at least 30 minutes of moderate physical activity five days week, if possible, for HPB prevention. For hypertensive people to achieve a more specific benefit, these authors recommend mild or moderate intensity aerobic training, which can be performed through different activities, at least three times a week, for 30-minute periods (Medina et al. 2010).

Bearing the results in mind, the functional physical activity intervention programme led to positive results when it comes to reducing BP. From this perspective, Silva, Clinton, Appleton & Flanagan (2011) mention that self-management education programmes help people become aware that they are their own caregivers and that health workers are consultants that will support them in that function. Based on the assumption that managing hypertension requires the participation of patients, it is essential to monitor its impact, especially on psychosocial and behavioural functions (Ferreira, 2012a,b).

CONCLUSIONS

We may conclude that, after the intervention, the participants show lower BP and greater control over it, and we may infer that the exercise programme can be replicated as a measure of therapeutic education and of assessing and auditing good health habits. Physical activity can thus be considered to exercise a specific physiological effect at the muscular and cardio circulatory levels improving overall health. It should therefore be encouraged throughout the entire lifecycle.

It is also necessary to make efforts to evaluate people's perspectives on health gains and quality of life obtained from the treatments. The strategies of preventive intervention for the occurrence of hypertension include salutogenic public policies combined with structured actions in the scientific/academic communities as well as in civil society and the media, promoting increasing health literacy and positive lifestyles to the average citizen.

Substantial empirical evidence points to the links between hypertension and the repeated occurrence of lifestyle errors, such as a sedentary lifestyle, poor eating habits, excessive consumption of salt, smoking, among others. Therefore, the focus should be on stimulating healthy behaviours, early diagnosis, and continuous treatment with the goal of achieving controlling BP by changing lifestyles addition to regular use of medication when necessary.

The results suggest that we should continue to conduct research to monitor the strength of the relationship between those variables. It is necessary to support an approach centred on the person with hypertension and through co-responsible self-management produce greater gains in health translated into fewer lives lost prematurely, fewer expenses with procedures/interventions that integrate the services provided by health systems among other benefits.

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