

THE EFFECTS OF THE WALKING PROGRAM ON FUNCTIONAL ABILITIES OF WORKING, MIDDLE-AGED WOMEN

Toplica Stojanović¹, Sanjin Hodžić², Darko Stojanović³ and Nikola Stojanović³

¹ Faculty of Physical Education and Sports, University of Banja Luka, Bosnia and Herzegovina

² Faculty of Physical Education and Sports, University of Tuzla, Bosnia and Herzegovina

³ Faculty of Sports and Physical Education, University of Niš, Serbia

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Abstract

The purpose of this research was an analysis of the effects created by an application of experimental treatment on functional abilities of middle-aged women. The research included 45 female subjects. The sample of subjects included women aged 35 to 50 years. The walking program was designed so as to keep the subjects in aerobic working zone at any moment of exercise. On the grounds of the obtained results it was determined that the changes in functional abilities of the subjects happened in the course of longitudinal processes. In the final measurement, three variables including diastolic blood pressure at rest, and working pulse at 65% and 85% of loading have shown lower results after treatment of the walking program.

Key words: walking, middle age, pulse, aerobic training

Introduction

From the physical aspect, „homo sedens“ at work and out of work is already recognisable and characterises a static loading in the muscles supporting sedentary or standing position and, on the other hand, an inactive muscle and joint groups. Such a disproportion of the muscle load disturbs a fundamental function of movement system, and as an organism functions synergistically each disbalance happens and reflects on the overall psychophysical status. A lack of physical stimulus reduces the level of abilities that is adapted to actual physical requirements, thus they reduce the work of organic systems particularly of cardiovascular and respiratory systems (Andrijašević, 2012). The researches related to benefits from body exercise indicate to a need for paying more attention to the body, as only with a balanced assessment of the mind and body it can be spoken of complete development, and of the right lifestyle of a modern man (Croatian Journal for Public Health, 2005). At today's level of comprehension a number of reasons may be mentioned for which the people of all ages, regardless of their health condition and age must walk regularly, in duration and at the pace that is possible. When it comes to working people, the following benefits from walking to their organisms can be emphasized, in particular: it affects favourably the work of heart and blood vessels (circulation of blood), regulates blood pressure (lowers high, and raises low blood pressure), eliminates excess weight by causing losing weight in the most natural way, lowers „bad “ and raises „good “ cholesterol, lowers high triglycerides in blood, lowers high blood sugar, increases lung capacity and oxidation in the blood, regulates digestion, increases functional and working abilities of the organism. The objective of this research is to determine effects of the walking program on functional abilities of working, middle-aged women.

Methods

Sample of subject

The sample of subjects in this research has been defined as a female population, aged 35 to 50 years. The research included 45 subjects who are employed and clinically healthy.

Sample of measuring instruments

The sample of measuring instruments for assessment of functional abilities in this research consisted of 5 tests covering an area of a bigger number of hypothetical factors, for which it may be assumed that they are responsible for positive cardiovascular health condition, as follows: 1. Heart rate at rest (FFSM), 2. Systolic heart rate at rest (FSKPM), 3. Diastolic blood pressure at rest (FDKPM), 4. Working pulse (FRP65), 5. Working pulse (FRP85).

Methods of data processing

The results of research were processed by means of Statistical package „STATISTICA 8.0 for Windows“. For the needs of this research, the following statistical analyses were made: 1. Descriptive statistics, where the results of the mean arithmetical values were presented (Mean), minimum (Min.) and maximum (Max.) results, standard deviations (Std. Dev.) and standard error of arithmetical mean (Std. Error). 2. Testing the normality of data distribution, where the results of symmetry (Skew.) and kurtosis of distributions (Kurt.) have been presented, 3. Student's T-test for dependant samples, by which significance of differences between the initial and final state was tested.

Results

Results of basic central and dispersion parameters and indicators of normality of distribution for the subjects in initial measurement are presented in Table 1.

Table 1. Basic statistical parameters of the subjects in initial state

Var.	N	Means	Min.	Max.	Std.Dev.	Std. Err.	Skew.	Kurt.
FFSM	45	74,49	50,00	105,00	13,39	2,00	0,46	0,07
FSKPM	45	120,02	79,00	162,00	19,44	2,90	0,44	0,05
FDKPM	45	83,22	65,00	114,00	12,44	1,85	0,74	-0,15
FRP65	45	159,98	148,00	173,00	5,62	0,84	0,56	0,28
FRP85	45	183,91	175,00	191,00	3,42	0,51	0,43	0,61

Legend: N – number of participants; Means – arithmetic means; St.Dev. – standard deviation; St.Err. – standard error of the arithmetic means; Skew. – skewness of distribution of results; Kurt. – kurtosis of distribution of results

Table 2. Basic statistical parameters of the subjects in final state

Var.	N	Means	Min.	Max.	Std.Dev.	Std. Err.	Skew.	Kurt.
FFSM	45	79,76	61,00	102,00	11,63	1,73	-0,01	-1,15
FSKPM	45	119,42	82,00	162,00	19,13	2,85	0,21	-0,56
FDKPM	45	72,02	50,00	108,00	11,84	1,77	1,02	1,56
FRP65	45	148,93	138,00	157,00	5,62	0,84	-0,37	-0,93
FRP85	45	174,00	166,00	179,00	3,62	0,54	-0,55	-0,62

Legend: N – number of participants; Means – arithmetic means; St.Dev. – standard deviation; St.Err. – standard error of the arithmetic means; Skew. – skewness of distribution of results; Kurt. – kurtosis of distribution of results

Table 3. Analysis of difference between the initial and final state

Var.	Means Ini.	Means Fin.	Diff.	t	df	P
FFSM	74,49	79,76	5,27	1,82	44	0,08
FSKPM	120,02	119,42	-0,60	-0,15	44	0,89
FDKPM	83,22	72,02	-11,20	-4,52	44	0,00
FRP65	159,98	148,93	-11,04	-10,22	44	0,00
FRP85	183,91	174,00	-9,91	-14,10	44	0,00

Legend: Means Ini. – arithmetic mean of the initial measurement; Means Fin. – arithmetic mean of the final measurement; Diff. – differences between the initial and final measurement; t – the value of the t-test for testing the significance of the differences of the arithmetic means; df – the degree of freedom; p – the coefficient of the significance of the differences in the arithmetic means

With an insight into those data it can be ascertained on the grounds of the relation between the standard deviation and arithmetical mean that the variables recorded homogenous characteristics, and parameters referring to symmetry and (elongation) distribution, describe normality of distributions with a slight epikurtic and platykurtic tendency.

Descriptive parameters of final measurement (Table 2.) also describe homogeneity of the analysed sample in the searched areas. The indicators of symmetry of distribution of the results for the subjects are within the limits of normality with a slight epikurtic tendency at the measuring instruments describing systolic blood pressure at rest (FSKPM), while the indicators of heart rates at rest (FFSM), and at the loading of 65% and 85% (FRP65; FRP85) recorded a slight hipokurtic tendency, and with diastolic blood pressure at rest the results were distributed asymmetrically and are bigger than the marginal ones, with a tendency of grouping toward the lower results (hipokurtic distribution). The values of statistical parameters of elongation distribution of the subjects' results (Kurt.) describe platykurtic distribution with all tests conducted. Results of the applied t-test for dependant samples were presented in the table 3.

Algorithm of the mentioned test has proved the significance ($p=0.00$) of differences with measuring instruments for assessment of diastolic blood pressure at rest (FDKPM), as well as with loading of 65% and 85% (FRP65; FRP85). The mentioned statements indicate to a conclusion that there is a statistically significant difference between the results of subjects measured at two different time points. Judging from the results of the table depicting a probability of zero hypothesis (p), according to which there is no differentiation between the observed dependant sample at initial and final measurement, it can be ascertained that although a certain deviation of numerical values of arithmetical means is evident, there is no a statistically significant difference in tests for assessment of heart rate at rest (FFSM) and systolic blood pressure at rest (FSKPM).

Discussion and conclusion

When we are aware of the fact that an increase in quantity of physical activity (within normal limits) causes the improvement of health status of individual of any age (Young & Dinan, 2005.), then we are also aware that health condition of an individual largely depends on their doing physical activity, which is particularly important for middle-aged or elderly people, who do not move

sufficiently due to everyday business obligations or comfort of modern lifestyle. Even the activities of low intensity, if conducted regularly, are sufficient for a considerable decrease in appearance of cardiovascular diseases (Erikssen, 2001.). When it comes to high blood pressure, which is deemed the most frequent illness in the civilised world today, many measures are taken in its treatment: change of lifestyle, change in eating habits, taking medications, application of physical activity. Chronic effects of physical activity, if applied three times per week, are often related to a lower blood pressure and decreased risk for development of cardiovascular diseases. However, physical activity that is performed seven times a week has a minimum additional influence in the sense of improvement of the state. In many researches, chronic effect of physical activity caused, on average, lowering of blood pressure by the average 10 mmHg. An exercise with participation of big muscle groups in duration of 20-60 minutes, with intensity of 50-85% of maximum oxygen uptake, if there are no contraindications, (Duraković, et al., 2007) is recommended. Such an activity that is not too strong, but is sufficient to cause positive changes, is recommended to middle-aged and elderly people, with the walking program that has been designed so that the subjects are at aerobic work zone at any moment. It is believed today that at least 50% of changes that are attributed to aging in populations of the developed world are not the consequences of aging but the consequences of atrophy due to inactivity. With aging, the function of cardiovascular system decreases, often at rate of reduction of the minute volume by 1% per year

starting from the beginning of the fourth decade, stroke volume decreases by 0.7% per year, and peripheral vascular resistance increases at the rate of 1.2 % per year. Cardio-respiratory capacity decreases in persons being very active in physical activities only by 1-2%, in those actively doing physical activity by around 4%, while in those physically inactive it reduces by at least 8-10%. After the 30th year of life, the minute volume of the heart reduces by around 30%, the highest heart rate by around 25%, systolic blood pressure by 10-40%, while diastolic pressure increases by 5-10%. Walking has a potential of playing the key role in primary and secondary prevention of cardiovascular diseases. It enables maintenance and even an increase in oxygen uptake of the myocardium, decreases the work of myocardium and its need for oxygen, increases the electrical stability of the myocardium, increases myocardial function at rest and at submaximum loading, increases the ejection fraction of the myocardium, increases contractile ability of the myocardium and reduces systolic load. It can be concluded that this research, which aimed at determining the effects of the walking program on functional abilities of the working, middle-aged women, indicates to an undoubted effect of this extremely accessible form of recreation in avoiding today's health disasters and to importance of this basic form of human movement, so „ordinary“ that a modern man takes it for granted. On the other hand, it is concluded that this is one of the researches that should stimulate new, more comprehensive and more complex analyses in the future, similar researches in these areas.

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UČINCI PROGRAMA HODANJA NA FUNKCIONALNE SPOSOBNOSTI ŽENA SREDNJE ŽIVOTNE DOBI

Sažetak

Cilj ovog istraživanja je bila analiza efekata nastalih primjenom eksperimentalnog tretmana na funkcionalne sposobnosti žena srednje životne dobi. Istraživanje je obuhvatilo 45 ispitanica. Uzorak ispitanica je obuhvatio žene starosne dobi od 35 do 50 godina. Program pješaćenja je bio koncipiran tako da se ispitanice u svakom trenutku vježbanja nalaze u aerobnoj zoni rada. Na temelju dobivenih rezultata utvrđeno je da je za vrijeme trajanja transformacijskih procesa došlo do promjene funkcionalnih sposobnosti ispitanica. U konačnom su mjerenju tri varijable: dijastolički krvni pritisak u miru, i radni puls pri 65% i 85% opterećenju pokazale niže rezultate nakon tretmana programa pješaćenja.

Ključne riječi: pješaćenje, srednja dob, puls, aerobni trening

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Correspondence to:

Nikola Stojanović

University of Niš

Faculty of sport and physical education

18000 Niš, Čarnojevića 10a, Serbia

Phone: +381 (0)18 510 900

E-mail: nikola987_nish@hotmail.com