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Original scientific paper

The Influence of Recreational Aerobics on Subjective Assessment of Psychosomatic Status of Women

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ABSTRACT: Sedentary life significantly affects the working abilities and health status of middle-aged women. On the other hand, appropriate systematic exercise can have a preventive effect on reducing symptoms and the appearance of some diseases, and thus have a positive effect on improving psychosomatic status. The research aimed to determine the subjective assessment of the psychosomatic status of women under the influence of recreational aerobics. The population from which the sample was drawn is a population of healthy women, age from 35 to 45 years, who dominantly live a sedentary lifestyle. For this study, a scale of subjective psychosomatic status assessment (SPPPS) was applied. The scale consists of 32 characteristic discomforts (disorders) which are divided into eight groups: shoulder and arm pain; back pain; leg pain; fatigue and sensorial discomfort; indigestion; cardiovascular disorders; neuropsychiatric disorders, symptoms of general fatigue. The Wilcoxon Signed Ranks test revealed statistically significant changes ($p = 0.000$) in all analyzed variables between initial and final measurements. Based on this finding, it can be concluded that recreational aerobics has a positive effect on improving the psychosomatic status of sedentary middle-aged women.

Keywords: recreational aerobics, subjective assessment of psychosomatic status, middle-aged women.

INTRODUCTION

A sedentary lifestyle causes serious health problems, negatively affects health, and causes many disorders (Çolakoğlu 2003, Biçer et al., 2005). A habit in an inactive lifestyle is one of the most important diseases affecting human health (Aydos and Dönmez 2000). An active lifestyle increases one's life energy and mobility and frees a person from an inactive life (Arcury et al., 2006). We must emphasize that the World Health Organization has set a goal for all countries to introduce, actively manage and control programs that improve healthy lifestyles (Van Herten LM et al., 1999). For a healthy life and quality-of-life improvement, physical activity is considered a necessary need of all people. Physically active people consider their active lifestyles to be a key factor in increasing the quality of long and healthy life (Haskell et al., 2007; McGrath et al., 2011). A sedentary lifestyle is associated with an increased risk of acute myocardial infarction and death from coronary heart disease (Kokkinos et al., 1995), and coronary heart disease is the cause of death in most countries of the world (Buyukyazi, 2008). This risk is approximately twice as high in inactive individuals compared to physically active people (Kokkinos et al., 1995). Physical inactivity has been recognized by the American Heart Association as an independent risk factor and comparable to other identified risk factors for coronary heart disease (Fletcher et al., 1992). Middle-aged women (35-45 years) who live a sedentary life, especially women who do office work, are exposed to risk factors due to insufficient movement, and the premenopausal period is marked by additional difficulties because of hormonal level changes. At this stage of life, most women are mostly familial, but they are left with great concern for their parents, who, among other things, pose an additional problem to change the concept of inactive to an active lifestyle. Premenopausal women are aware of their health status, and one of the ways to positively affect their psychophysical health and work abilities is certainly systematic recreational exercise.

With systematic exercise, we can prevent non-communicable diseases such as hypertension, diabetes, cardiovascular diseases, as well as other diseases. If we want to influence general health through exercise, then it is recommended to apply programs for improving cardiovascular endurance (CVE) because they are the most important measure of overall health (Koksal et al., 2006). A person's level of cardiovascular endurance helps prediction of disease likelihood, quality of life, and ability to respond to acute physical and mental stress (Forbes, 1991). Corbett (2009) implied that "For healthy individuals, higher cardiovascular endurance indicates an increased level of physical ability." The aerobic exercises applied in this research, use large groups of muscles to increase the pulse, which with their faster work cause deeper breathing as well as higher oxygen consumption. This is evidence that cardiovascular endurance improves after aerobic exercise and therewith causes positive changes in the body's cardio-respiratory system (Probart et al., 1991).

One of the ways how we can assess current health is through a subjective assessment. Subjective health or self-assessment of health is used in health research (Congdon, 2001) and is considered one of the most reliable indicators for health status evaluation (Okano et al., 2003) as well as a strong predictor of mortality (Tsuji 1994, Kaplan et al., 1996; Idler and Benyamini, 1997; Sundqist and Jonson, 1997; Miilunpalo et al., 1997). McKee and Ryan (2003) consider subjective health assessment to be a significant indicator of health. Determining the health status of an individual and a group by self-assessment is now done with standardized questionnaires in epidemiological and populational research. Self-assessment of health, as a subjective measure, is related to human well-being, because it includes the assessment of both physical and emotional health. For most people, subjective health is primarily a determinant of quality of life-related to health (Despot Lučanin et al., 2006). The basic concept of subjective health assessment is that people have a sufficient degree of control over their health behavior and the belief that behavior has a certain impact on their health (Lim, 2021). Physical activity can affect subjective health assessment (Sun et al., 2016) and significantly reduce the risk of cardiovascular disease, overweight, obesity, and diabetes (Van den Berge et al., 2016). For health promotion and prevention of chronic diseases, endurance training of moderate intensity (60% to 75% of maximum heart rate) is recommended, at least 3-5 times a week for 30-45 minutes (De Backer et al., 2003). To test our hypothesis, we devised an experiment in which the treatment was recreational aerobics, and the dependent variable we had an interest in were changes in self-assessment of participants' subjective psychosomatic status after the experiment. The scale of subjective psychosomatic status assessment (SPPSS) used in this study is a comprehensive health self-assessment. The scale was first developed by Blagajac et al. (1992) and it has been accepted through studies on the subjective assessment of psychosomatic status.

In previous research, the effects of different exercise models on health were determined, and health assessment was also measured using different questionnaires. This research differs from the previous ones in that the sample consisted of premenopausal sedentary women aged 35-45 who did office sitting jobs and a recreational aerobics experiment was performed and changes in the subjective assessment of psychosomatic status were determined.

MATERIALS AND METHODS

Sample of participants and variables

The study was conducted on a sample of 38 female participants, aged 35 to 45 years. For this study, women who do sedentary office work were randomly selected. They underwent a medical examination and had to be healthy for inclusion in the systematic exercise under the "Recreational Aerobics" program.

Respondents who participated in the study had to meet the following criteria: to be workers and to do office work in a sitting position; that they have no somatic defects or diseases; not to engage in other organized forms of physical activities other than participating in the "Recreational Aerobics" program; to participate in the exercise regularly (three times a week) and to have voluntarily accepted the exercise program. There were 36 recreational aerobics training (classes) led by a licensed aerobics instructor. Participants were also given instructions on the benefits of exercise and proper nutrition. Before and after the exercise program, the Scale for subjective assessment of psychosomatic status - SPPSS (Blagajac, 1992; Vučković, 2003) was applied to evaluate the impact of the experimental treatment. The SPPSS scale consists of 32 characteristic ailments (disorders) that are divided into eight groups: shoulder and arm pain; back pain; leg pain; fatigue and sensorial discomfort; indigestion; cardiovascular disorders; neuropsychiatric disorders; symptoms of general fatigue. Each participant estimates the existence and severity of each of the 32 listed disorders. In this way, a numerical expression of the subjective assessment of the severity is attained for each disorder on a scale of 1-9 (from 1 - does not feel to 9 - unbearable) and the average value of the assessment for each of the eight groups of problems, as well as for the whole scale.

Experimental treatment

The recreational aerobics program lasted for three months, ie. 12 weeks. Training sessions were held three times a week in the evening. Each training lasted 60 minutes and was realized according to the basic structure of aerobics classes: warming up, the main part of the training, cooling down and stretching (Zagorc, Zaletel and Ižanc, 1998). The intensity of the exercise was determined by the tempo of the music, which changed during the training (differed in accordance with the parts of the training). Warming up (8-10 minutes, tempo music 120-135 bpm, march, step touch, side to side) means preparing the whole body for the following efforts, in order to increase body temperature and blood circulation (Brick, 1996). The main part of the training includes the aerobic (A) part and body shaping exercises (Part B - treatment of specific muscle groups). The aerobic part (20-30 minutes, tempo 135-155 bpm, combinations of Low impact and High impact steps) contains activities aimed at the development of the cardiovascular and respiratory systems (Mišigoj-Duraković, 1997). The conditioning part of the class (Part A) is programmed so that the subjects are in the aerobic zone during workout. The load was measured based on internal indicators (heart rate) by palpation on the carotid artery after a given block of exercises (during the break between the next set of exercises). Based on the obtained heart rate, the intensity of the load was monitored during the realized task. Before each activity, participants knew what the expected heart rate during the activity is. Within the B part of the training (10 minutes, tempo 120-135 bpm), exercises were performed to strengthen the abdominal muscles, back, arms and shoulder girdle, abductors and adductors and gluteal muscles (Furjan - Mandić et al., 2011). Cooling down and stretching (5-10 minutes, tempo up to 100 bpm, relaxation, and static stretching exercises) in this part of the training primarily aimed to lower the heart rate. After that, gradual transfer from standing to sitting and lying position on the abdomen and back is performed, with a combination of relaxation and stretching exercises of fatigued muscles, all with appropriate music that enhances mental and psychological relaxation (Kostić, 1999; Nićin, 2003). The recreational aerobics program is adapted to the participants' age and is designed to include exercises and movements that activate muscles that are not sufficiently engaged during professional work. Training sessions are planned for each month and adjusted to the volume and intensity of the load, and the participants' capabilities. The optimal load intensity was determined according to the limits of 60% to 85% of the maximum heart rate (Stojiljković, 2005), which means that in the first month the load ranged from 60–65% of the maximum individual's heart rate, and in the second month 65–75%. In the third, the last month of the experiment, the load was in the zone of 75–85% of the maximum individual heart rate.

Statistical data analysis

Data collected during the survey were processed using the IBM SPSS 20.0 personal computer statistical application program. For the analysis of basic statistical data and distribution of results at the initial and final measurement, the basic descriptive parameters - arithmetic mean and KS test of normality of distribution of results were calculated. The Wilcoxon Signed-Rank test was used to test the difference between the initial and final state of the subjective assessment of psychosomatic status. The statistical significance was determined at the level of $p < 0.05$.

RESULTS AND DISCUSSION

The analysis of the health status of the participants was performed using a questionnaire that contained 8 composite variables. They are formed by summing the scale scores of assessment indicators that are grouped on these variables. Given the initial characteristic of the assessment scale that belongs to the ordinal level of measurement, we checked the normality of the distribution of the formed composite variables (Table 1) to choose further data processing. The obtained values of the Kolmogorov-Smirnov test indicate the fact that the distributions of the obtained variables in most cases deviate statistically significantly from the normal distribution, especially on the initial measurement.

Table 1: Normality distribution test of variables for subjective assessment of the psychosomatic status of the participants at the initial and final measurement

Variable	Initial			Final		
	AS	KS test	p	AS	KS test	p
Shoulder and arm pain	5.78	1.75	.004	9.42	1.07	.202
Back pain	5.57	1.28	.074	9.73	.67	.760
Leg pain	5.65	1.23	.097	9.52	1.12	.162
Fatigue and sensorial discomfort	5.60	1.30	.065	8.68	.88	.408
Indigestion	3.81	2.14	.000	4.92	1.65	.009
Cardiovascular disorders	6.26	1.08	.188	11.21	.91	.368
Neuropsychiatric disorders	7.68	1.14	.148	11.60	.92	.363
Symptoms of general fatigue	7.52	1.12	.160	12.28	.88	.409

Table 2: Analysis of differences between initial and final subjective assessment of the psychosomatic status

Variable	Rank	N	Mean rank	Z	p
Shoulder and arm pain	Negative rank	2	4.00		
	Positive rank	26	15.31	-4.452	.000
	Equal rank	10			
Back pain	Negative rank	1	2.50		
	Positive rank	32	17.45	-4.985	.000
	Equal rank	5			
Leg pain	Negative rank	1	7.00		
	Positive rank	30	16.30	-4.738	.000
	Equal rank	7			

Fatigue and sensorial discomfort	Negative rank	2	2.75		
	Positive rank	24	14.40	-4.335	.000
	Equal rank	12			
Indigestion	Negative rank	3	9.17		
	Positive rank	17	10.74	-2.911	.000
	Equal rank	18			
Cardiovascular disorders	Negative rank	1	3,00		
	Positive rank	33	17.94	-5.052	.000
	Equal rank	4			
Neuropsychiatric disorders	Negative rank	2	4.50		
	Positive rank	31	17.81	-4.862	.000
	Equal rank	5			
Symptoms of general fatigue	Negative rank	1	2.50		
	Positive rank	33	17.95	-5.053	.000
	Equal rank	4			

When the difference between the initial and final subjective assessment of the psychosomatic status of the participants is analyzed (Table 2), it is noticeable that the values of the Z coefficient are high, positively oriented ranks predominate, i.e., higher score values on the initial measurement. The differences in all analyzed variables are high and statistically significant. The conclusion is that upon the utilization of treatment, the subjective assessment of the psychosomatic status of the subjects of the experimental group "Aerobics" significantly improved.

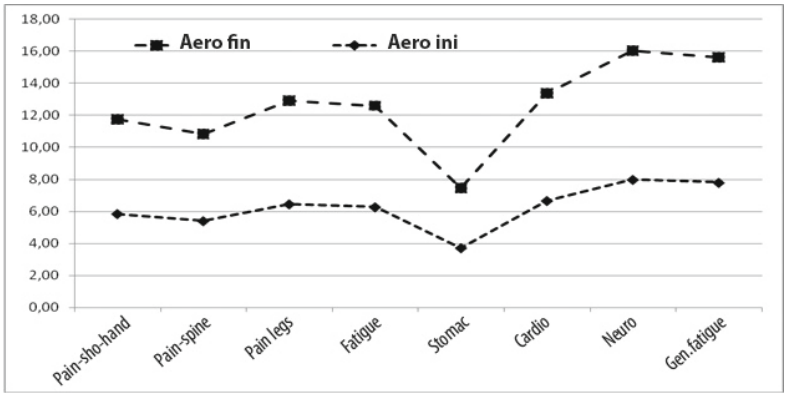

Figure 1. Linear changes in psychosomatic status indicators

This study aimed to examine whether exercise based on the recreational aerobics model improves the psychosomatic status of middle-aged women who do office sedentary work. For this purpose, 38 middle-aged women (35–45 years), who completed a questionnaire on subjective assessment of psychosomatic status before and after the experiment, were included. Variables were assessed to assess the psychosomatic status of women with eight groups of symptoms - pains, namely: shoulder and arm pain, back pain, leg pain, fatigue and sensorial discomfort, indigestion, cardiovascular disorders, neuropsychiatric disorders, and general fatigue symptoms. The results show that the differences between the initial and final subjective

assessment of the psychosomatic status of the participants (Table 2), in all variables are high and statistically significant. The values of the Z coefficient of the analyzed variables are high and positively oriented ranks predominate, i.e., higher score values on the initial measurement. The largest differences were registered in the variables: symptoms of general fatigue (Z = - 5.053, p <.000) and cardiovascular disorders (Z = -5.052, p <.000), and they are slightly weaker in the variable back pain (Z = - 4.985, p <.000). The weakest results, but statistically significant, were achieved in variable indigestion (Z = - 2.911, p <.000). Other variables, neuropsychiatric disorders (Z = - 4.862, p <.000); leg pain (Z = - 4.738, p <.000); shoulder and arm pain (Z = - 4.452, p <.000); fatigue and sensorial discomfort (Z = - 4.335, p <.000) showed moderately statistically significant results.

These results were expected given that the participants were inactive before joining the experimental program, and they were not included in any systematic physical exercise. It is very easy to bring the organism to the general fatigue, it is only necessary to do sedentary work. Symptoms/discomforts of monotony, drowsiness, insomnia, feeling weak and sluggishness of movement can be easily eliminated by aerobic training. Certainly, everyone needs a personal diagnostic, a recommendation of a specific exercise program and a professional instructor who will supervise the work, control and determine the load, and motivate the program participants. However, the best results (symptoms of general fatigue) indicate that office sedentary work caused general fatigue that should be compensated by another type of activity, the opposite to work-related one. A good indicator of the previous statement is the result achieved in the second variable cardiovascular disorders (shortness of breath, faster fatigue, profuse sweating, chest pain) with the achieved result Z = -5.052, p <.000, where the recreational exercise program had a good - opposite effect of professional work. Cardio exercises of recreational aerobics have a good effect on cardiovascular health (prevention of myocardial infarction, normalization of blood pressure, better blood circulation of the muscular and vascular system, strengthening of lung capacity). It is hard to tell which symptom should be addressed first, but cardiovascular health can prevent most other diseases. Symptoms of back pain (neck area, chest area, lumbar area) are typical pains due to the lack of stretching of the spine and the profession associated with sitting jobs. Stretching allows for better blood flow to the spine muscles as well as all the vertebrae of the spine. In our therapeutic recreational aerobics, each workout included spinal stretching exercise complexes resulting in this improvement. Our results suggest that the symptoms of indigestion (nausea, indigestion, loss of appetite) are weaker, but statistically significant (Z = - 2.911, p <.000). We believe, as confirmed by this research, that moderate aerobic training, a balanced diet, and life hygiene can alleviate these problems. Other variables, neuropsychiatric disorders (Z = - 4.862, p <.000); leg pain (Z = - 4.738, p <.000); shoulder and arm pain (Z = - 4.452, p <.000); fatigue and sensorial discomfort (Z = - 4.335, p <.000) showed moderately statistically significant results. If we analyze these variables and their symptoms, it can be concluded that the cause of most of these symptoms is constant sitting and mental strain with the dynamics of work conditioned by deadlines. Furthermore, we can accept that with prolonged sedentary jobs there is a lack of movement during working hours, sitting causes a lack of necessary circulation in the extremities, breathing and pulse are in a much lower load, which slows down and insufficiently activates the functions of organ systems and the body as a whole. Some studies that have dealt with similar issues and in which the results corroborate in some variables with our study are mentioned in the further text of the paper.

A questionnaire on the subjective assessment of the effects of exercise (functional and motor abilities, mood, reduction of health problems - Trkulja Petković, 2000) on the life quality of middle-aged women was used by Katić et al. (2018). The study included two groups of middle-aged women (Group A: up to 5 years of exercise experience and Group B: over 5 years of exercise experience) who attend dance recreational activities. The participants from group B achieved statistically significant higher results in all

statements on subjective assessment of the effect of dance recreational activities compared to participants from group A. The biggest differences were observed in the following statements: I maintain body weight more easily, I move easier and safer, my self-confidence has improved, I am more satisfied with my appearance, and I made new friends. The authors concluded that the active participation of middle-aged women in dance recreational activities has a positive effect on their life quality and contributes to the experience of better life satisfaction. The participants from group B attained statistically significant higher results on all statements of subjective assessment of dance recreational activity. The largest differences were noted in the following statements: I maintain body weight more easily, I move easier and safer, my self-confidence has improved, I am more satisfied with my appearance, and I made new friends.

The scale for subjective assessment of psychosomatic status was applied by Vučković (2003) on 100 participants who were subjected to an experiment with different models of recreational activities and physio-prophylactic procedures. By factor analysis, seven factors were extracted (emotional lability, locomotor apparatus pain, indigestion, exhaustion, shortness of breath, leg pain, sensorial fatigue) that author regards as important ones to lower the subjective feeling of existence of most indicators (health problems and disorders) in all eight groups. The author concludes that the scale is suitable for diagnostic and prognostic purpose, as well as for the assessment of the effects in individual models of sports recreation.

The level of physical activity and subjective assessment of health status was researched by Jurakić (2009) on a representative sample of the working, middle-aged population, from 40 to 65 in the Republic of Croatia. The total sample consisted of 766 participants (52% women and 48% men). The IPAQ questionnaire was applied to assess the level of physical activity, and the SF-36 questionnaire was used to assess health status. The study aimed to determine the status and relationship between physical activity and health status of middle-aged workers in the Republic of Croatia and to classify the participants into homogenized groups concerning physical and mental strain in the workplace and determining groups' interest in sports and recreational programs in order to design appropriate models of sports and recreational programs. The study has determined the middle-aged workers' level of physical activity. The results indicate that the recommended level of physical activity in leisure time, which is 30 minutes of moderate-intensity physical activity five times a week, is reached by 29.67% of men and 32.75% of women, meaning that approximately two-thirds of participants are not physically active enough. Furtherly, a negative correlation between physical activity at work and physical activity during commuting with subjectively assessed physical health and a positive correlation between physical activity in leisure time with subjectively assessed physical and mental health were determined. The author concluded that there is a positive correlation between physical activity in leisure time and health in middle-aged workers in Croatia.

CONCLUSION

Exercise based on the "Recreational Aerobics" model improves the psychosomatic status of middle-aged women who do office sedentary work. The variables used to estimate women's psychosomatic status had statistically significant changes after the experimental treatment. The best results were obtained in the variables symptoms of general fatigue, cardiovascular disorders, and back pain. Considering that the experimental treatment has achieved positive results on the psychosomatic status of middle-aged women, the latter can be recommended for leisure activities. The authors also suggest testing of other recreational exercise models, e.g., recreational swimming, where the influence of the exercise in water on the health status of middle-aged women would be examined.

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