

„Wpływ różnych form treningu, stosowanego w klubach fitness, na zmiany ciśnienia tętniczego, tętna i wydolności fizycznej u zdrowych młodych dorosłych i seniorów”

SUMMARY

Introduction: Cardiovascular diseases are the main causes of premature mortality in the societies of developed countries. Despite the continuous development of pharmacotherapy and invasive treatments, more than a half of all deaths in the world are still directly or indirectly related to the heart and vascular pathologies. It seems that the primary prevention methods are still not fully applied in order to control this group of diseases. It is now common knowledge that regular physical activity reduces the spreading of atherosclerosis risk factors such as obesity, lipid disorders, hypertension and diabetes. And despite this knowledge there is a constant trend towards limiting physical activities and an increasing popularity of sedentary lifestyle – both in the young generation as well as among older people.

One of the methods used to activate the society is the search for new, attractive forms of physical exercises – which give the expected results based on the "old rules" and which might be a more interesting, more popular and more willingly followed prophylaxis. It is obvious that one of the criteria considered while choosing the type of recreational physical activity is the given person's age. Young people will surely prefer other sports than older people. These needs are more and more often answered by sports clubs, including the so-called "fitness clubs", which offer various training types, including trainings that are not always associated with sport as it is traditionally understood. It is an open question, whether these new and often very attractive forms of recreational physical activities can ensure objective benefits when it comes to the improvement of anthropometric measurements, physical fitness and metabolic parameters, which in the long run may result in a reduced overall cardiovascular risk.

Objective: The objective is to evaluate the influence of modern physical activities performed in fitness clubs, properly adjusted to the age, on hemodynamic, metabolic and general physical fitness parameters of the training participants, as well as to draw a comparison between the effectiveness of particular training types within the analysed age categories.

Material and methods: The study was carried out on 80 healthy volunteers, who declared their willingness to participate in physical activity classes in a fitness club and passed the preliminary recruitment process. Due to their age, the respondents were assigned to 2 main groups: Young Adults (20-40 years old), and Seniors (60-80 years old). In each age grade there were 2 training subgroups of 20 people each. Among the Young Adults these groups included: Aerobics subgroup (A) and Bodybuilding subgroup (B), while among the Seniors the groups included: Dance subgroup (T) and Pilates subgroup (P). Each of the subgroups underwent a different training programme for a period of 6 months. The following tests and measurements were performed before the start and upon the completion of these training programmes:

2. Basic tests – haemodynamic parameters: resting blood pressure and heart rate as well as physical fitness tests: Harvard step test and Cooper test in the group of Young Adults, as well as Kash Test and 6-minute walk test in the group of Seniors.

3. Additional tests – anthropometric and metabolic measurements: BMI value, waist and hip circumferences, percentage of subcutaneous fat tissue and body composition analysis using the bioelectrical impedance analysis (BIA): fat tissue percentage, muscle tissue percentage and metabolic age. Statistical analyses of the collected material were performed using the IBM SPSS Statistics package, version 25. The value $\alpha = 0.05$ was assumed as a statistical significance level.

Results: In all four subgroups, the average resting values of systolic and diastolic blood pressure as well as the heart rate could be reduced as a result of performed trainings. In both Senior subgroups (Dance and Pilates), these changes were statistically significant ($p < 0.005$ and $p < 0.001$). In the group of Young Adults, a significant reduction in the aforementioned parameters was observed only in the Aerobics group, whereas in the Bodybuilding group merely the resting heart rate was significantly decreased, but no statistically significant changes related to blood pressure values were stated.

At the end of the training programmes, the evaluated results of physical fitness tests were improved in all subgroups in comparison with the initial values, whereas these changes were of statistically significant nature in both subgroups of the Seniors: Dance (T) and Pilates (P) – Kash test – HR after the test (T: $p < 0.001$, P: $p < 0.001$); Borg scale (T: $p < 0.05$, P: $p < 0.05$); 6-minute walk test: increased HR after the test (T: $p < 0.001$, P: $p < 0.05$); Distance (T: $p < 0.05$, P: $p < 0.001$); Borg scale (T: $p < 0.05$; P: $p < 0.05$).

In the group of Young Adults, a significant improvement was stated in Cooper test in the Aerobics subgroup (HR ($p = 0.001$); Distance ($p < 0.001$); Borg scale ($p < 0.05$), with an insignificant improvement in Harvard step test, whereas in Bodybuilding subgroup an improvement was stated in Harvard step test (FI ($p < 0.05$); Borg scale ($p = 0.001$)), with very insignificant changes in Cooper test.

In all four groups, a significant improvement in the metabolic parameters was observed after the end of the training programmes: there was a reduction in the BMI value, waist and hip circumference, the percentage of subcutaneous fat tissue, percentage of the total body fat and metabolic age. Moreover, a significant increase in the muscle tissue volume was observed in the Senior group – Dance ($p < 0.05$) and Young Adults group – Aerobics ($p < 0.05$).

During the whole training cycle there were no negative side effects such as cardiovascular incidents or injuries of the osteoarticular and muscular system. The only side effects reported by the participants were muscular pains after the first training cycles, which subsided however within the course of the training programme.

Conclusions:

1. Popular recreational activities offered in fitness clubs, properly adjusted to the age of the given person, performed systematically and under the supervision of a physiotherapist are an effective and safe form of physical activities, both for young adults and for elderly people.

2. The applied training programmes bring significant benefits in terms of physical fitness as well as an improvement of metabolic and anthropometric parameters.

3. All the applied training sessions have a positive impact on the modification of the body composition: they reduce the BMI value, the % of subcutaneous fat tissue and total body fat, as well as the waist and hip circumference.

4. In the Senior group, Dance classes have a greater impact on the results of 6-minute walk test in comparison to Pilates sessions.
5. In the Senior Group, both Dance and Pilates may be recommended to reduce the resting blood pressure and resting heart rate values.
6. In the group of Young Adults, Aerobics –TBC and Bodybuilding sessions contribute to an increase in physical fitness and a reduction in resting heart rate values.
7. Aerobics –TBC, unlike Bodybuilding, leads to a reduction in resting blood pressure values.
8. A training including dance classes contributes to an increase in the muscle tissue volume in the body of elderly people.