
PROFILE OF HEALTH- RELATED EFFICIENCY AND SETTING TARGETS FOR PHYSICAL ACTIVITY ON THE WAY TO DESIGN FUNCTIONAL TRAINING PROGRAM FOR GROUP OF WOMEN AGED 60-80 YEARS

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- health-related exercises,
- health-exercise capacity,
- physical tests,
- elderly people,
- body mass index

Abstract:

The aim of the study was to create a profile of health-related fitness, setting targets for physical activity and finally based on the research results create healthy training for group of women aged 60-80 years. Screened sample was composed of 33 healthy, senior women participated in regular physical activity. In clinical diagnostic survey method was used and modified battery of fitness tests at the Institute Aerobic Research (IAR) in Dallas as well. Based on the test results and their classification according to IAR standards for each subject, health-related fitness profile protocol was prepared. The main purposes for older women to participate in regular physical activities is to: prevent joints diseases, increase immunity and improve overall well-being. Aerobic capacity and flexibility showed the best level from all of the investigated skills. Muscle strength presented the lower results. On the basis of the classification according to the standards IAR test results, it was found that "runner" is dominant model among women involved in health training. It was Concluded: Health training for women aged 60-80 with varying levels of physical fitness and health should include a program of exercises targeted at specific components of motor skills (muscle strength, aerobic capacity, flexibility) taking into account the individual needs of older people most. It is highly required to improve the muscle strength among screened sample.

INTRODUCTION

The essence of every human life is movement. It not only stimulates the development of the physical, but also psychological and functional, improving our creative and reproductive activity, regardless of the capacity in which it manifests itself - whether it is a job, daily, or artistic. Physical activity shouldn't be a responsibility for the health, but an integral part of the rhythm of human life all day taking into account work and spare time.

Nowadays, more and more attention is paid to physical activity of older people, due to the ever increasing rate of life expectancy.

The basic condition for the elderly high-quality physical activities is a detailed assessment of health-related fitness profile based on a battery of fitness tests and in accordance with modern knowledge, as well as psycho-social status of the participants. The efficiency of pro-health is a state of the body, which is characterized by the ability to perform daily tasks with vigor and signs that accompany the small risk of premature emergence of diseases associated with poor physical fitness [8].

Increased interest in senior physical activity is associated with still increasing number of older people in society. Extensive research shows the U.S. population is the increasing in their numbers in relation to the twentieth century, and predict the further strengthening of this trend (Figure 1). As expected, the researchers proportion of older people in the United States in 2030 will be approximately 20% of the total population, and 20 years later, as many as 30% [10].

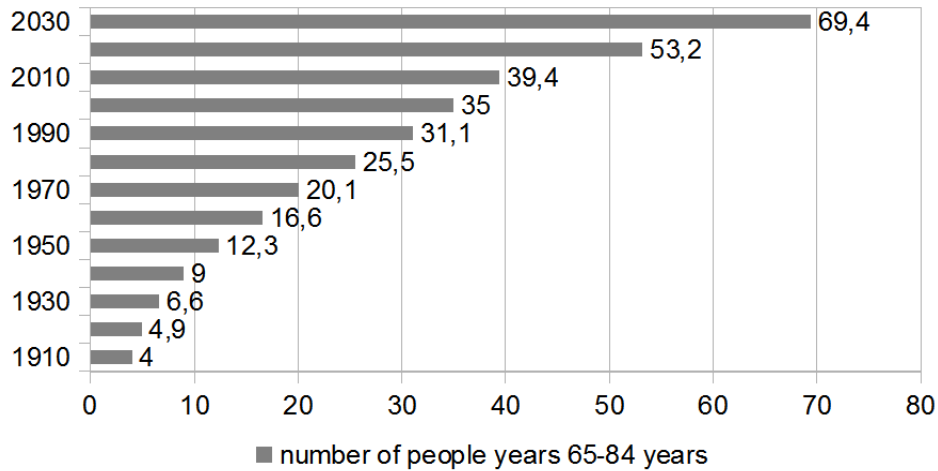


Figure 1. Demographic changes in the U.S. population of persons aged 65 - 84 years, from 1910 to 2030

The European Research Infrastructure Research SHARE (2009) shows that the Polish population aged 50 and older is in a worse physical and mental state compared to people in other European countries. In addition, Poland recorded a growing number of health limitations in daily activities (such as climbing stairs, getting up from the bed, etc.), which may be related to the low rate of physical activity - only 39% of men and 27% women participation in sports and declares performing physical work at least once a week, compared to 65% of men and women in the Netherlands.

Analyzing lifestyle and physical activity of older women shows irregular and often inadequate movement to meet their needs [6]. Implementation of inadequate training plan: first, does not meet its specific role involitional processes delaying and preventing worsening of chronic diseases, and second, can lead to a deepening of already existing medical conditions, or create a new problems [8].

The assessment of efficiency is very important in promoting health, not only the level of muscle strength or exercise capacity, but also other parameters: strength endurance, coordination, balance, flexibility, related to the maintenance of physical independence. [1]

Health training is a multistep process that directly affects the body's adaptability to effort, and a well-programmed should encourage self-development and take in an organized physical activity. Training components such as intensity, frequency, type of exercise, the duration of the training, the way of teaching and practicing health are the main tool of coach work [2]. Physical activity programs for 60-80 year old women's groups should include a sufficiently long period and frequency of rehabilitation, monitoring the effects by assessing the level of health-related fitness and an attractive program of physical activity motivating those to the systematic participation in it [1].

THE AIM OF STUDY

The aim of the study was to create a profile of health-related efficiency, setting targets for physical activity and to obtain comprehensive information about individual characteristics of the functional status of women in the age group of 60-80 years.

MATERIAL AND METHODS

In the study participated 33 women, aged 60-80 years, participating in exercise classes for seniors three times a week. The average age of the patients was 69.1 ± 5.4 [years].

Average length of training was equal to 2.6 ± 1.7 years. The average height of the body is 162 ± 4 [cm] with a mass equal to 64 ± 7 [kg].

The fitness tests were used with the Institute Aerobic Research (IAR) in Dallas, modified by Kuński, and the method of diagnostic survey questionnaire technique.

Table 1. Characteristics of the study group [n = 33]

Indicators	X	±SD	CV [%]
Age [years]	69,1	5,4	9
Body height [cm]	161,6	6	4
Body mass [kg]	70,3	12,4	18
Training seniority [year]	2,6	1,7	8

The survey consisted of 23 closed questions, multiple and single choice, diagnosing a questionnaire aims to participate in the classes. The results of fitness tests were confronted with the available standards developed in IAR, suitable for people over the age of 60 years. EXCEL spreadsheets were used for the statistical analysis results .

All fitness tests have been adapted to be performed under field conditions and included: studying the physical efficiency test (walking over a 2 km distance), two trials examining the level of muscle strength (traces of lying back) and tests measuring body flexibility (slope in front). Based on the results of the pro-health protocol capability profile of each tested person (Kuński).

Two kilometers distance walking test was conducted for the five-minute warm-up, at exactly the measured distance of paved roads. The results were reported accurate to the second. Used to measure time stopwatch [8].

The test measures strenght level were traces of lying back. In a position lying back with legs tested person bent the knees at 90 degrees and your feet at a distance of about 30 centimeters. For the test signal peaks touching knees with the hands, and then returned to lie on the back. This was repeated for one minute.

The last test to examine the level of flexibility. The result of the test was a flexibility measure of the lower spine and hamstrings. The study performed sit straight, so that both feet should be together close to each other and whole soles based on the wall. Knee need to be close to each other and straight. From this position, slowly bend in front, hands facing forward. Item must be maintained for ten seconds. Centimeter scale measuring ruler was glued to the floor [8].

Last test included BMI (Body Mass Index), which was observed body weight, overweight and obesity. BMI is calculated by dividing weight in squared kilograms of the height in meters.

Based on the test results create pro-health capability profile of each person being tested [8]. A separate assessment of motor skill of each tested person characteristic motor test allowed of each person to qualify for one of four health-related fitness profiles (runner, player, gymnast, comprehensive efficiency). Diagnosis in this respect is the basis to design individual training programs with particular emphasis on the person's specific needs.

Below health-related efficiency profile model is most similar to the "runner" model (Table 2). It is characterized by high aerobic capacity level (good) and flexibility (good), the average level of strength (average rating) and low body mass index (good).

An example of the protocol pro-health capability profile
Name: J.N.

Age: 66 years
 Gender: female
 Resting heart rate 61 contractions / min
 Resting blood pressure: 136/83 mmHg
 Walk (2 km): 19 minutes
 Traces of lying: 11 times / min
 Slope in front: 20 cm

Table 2. The results of the study pro-health capability profile

Evaluation	Aerobic capacity	Strenght	Flexibility	BMI
good	X	-	X	X
average	-	X	-	-
sufficient	-	-	-	-
bad	-	-	-	-

The study began by performing a diagnostic survey questionnaire technique. The first point of the analysis was the women's group physical activity in the past and today.

In the case of the former (Figure 4), the most commonly forms were cycling (30%) and gymnastics (22%), followed by running and swimming with the same result equal to 17%. Least popular sport among the respondents was canoeing which indicated only 2% of respondents.

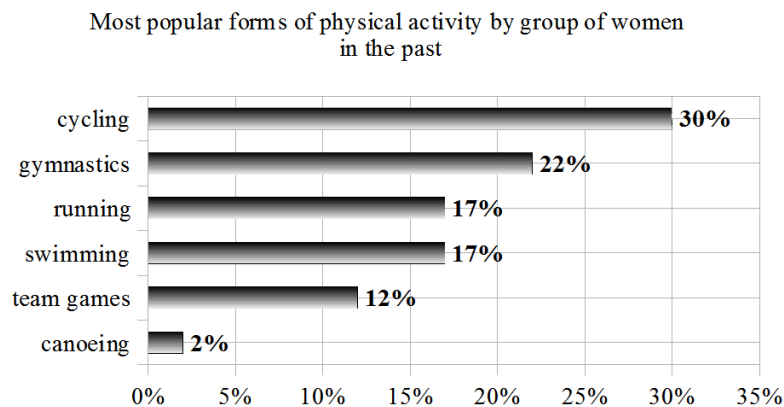


Figure 4. Most popular forms of physical activity by group of women in the past

It turns out that the preference for physical activity, women have changed over the years. Today the most popular form of physical activity undertaken within the study group is popular lately, Nordic Walking (23%), followed by strength training (21%), swimming (20%).

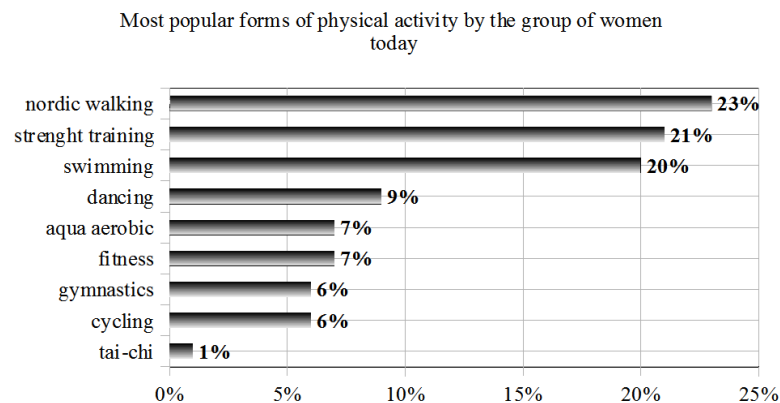


Figure 5. Most popular forms of physical activity by group of women today

Less interest among respondents was aqua aerobics (7%), fitness (7%), gymnastics (6%) and cycling (6%). Liked on the past running does not appear in the favorite forms today (Fig. 5). Among the respondents were also people practicing tai-chi (1%).

As the most common targets for physical activity examined women declared: preventing disease and improve their joint mobility, increase immunity and improve the well-being (Ryc.6).

The majority, 66% of respondents declared that increasing joint mobility, through regular training, it is most important to them, while 3% of the respondents considered this aspect as a not necessary. The possibility of increasing the body's resistance, by participating in sports, sees more than half of the respondents (Ryc.6). High percentage of 60% senior maintains that it is the most important goal of any physical activity, 37% consider it to be important or very important, and for 3% it has no meaning.

For 5% of the women well-being feeling is not as important motive incentives for sports. The remaining 95% of the respondents considered a good mood as the most important (53%), very important (32%) and significant (10%) result of regular exercise.

Calculate the weight-growth was the next point of analysis. More than half of the respondents (58%) have a weight qualify for the standard, 21% suffer overweight. Other participants characterized dangerous I, II or III obesity level (0,03).

Next focus of the analysis was to evaluate the performance of the women based on the IAR tests. The best assessment of aerobic endurance (capacity) received - 58% of the women received the highest rating - good (Table 2). One quarter of seniors received ratings below average - 9% sufficient and 15% bad. Nearly half of the respondents diagnosed with the average level of strength, and the same number of respondents - almost (24%) were assessed both good and enough. The flexibility level rated good in 42% of seniors, average for 18%, sufficient level for 31% of seniors, 9% respondents was characterized by low level.

Classification of body weight of the women according to BMI

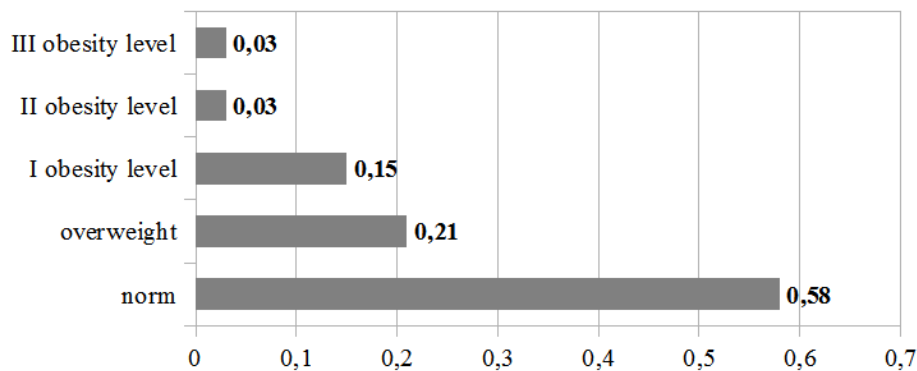


Figure 7. Classification of body weight of the women according to BMI

Based on the assessment of individual components, the dominant women's health-related efficiency profile was set (Table 3). It turns out that most seniors (34%) presents a model of the "runner" is characterized by a high level of aerobic capacity, low power level and average flexibility skill, with a low body mass index. About 30%, was characterized "comprehensive efficiency" model, where all the values of the examined indicators are close to the average level.

"Player model" characterized by a medium level of aerobic capacity, low strenght skill, high - flexibility, with the high body mass index was diagnosed in 21% of wome

Table 3. Evaluation of individual health-related fitness characteristics group of women

assessment motor skills	Aerobic capacity	Strenght	Flexibility
good	58%	24%	42%
average	18%	49%	18%
sufficient	9%	24%	31%
bad	15%	3%	9%

Other tested (15%) classified as "gymnast" model which is characteristic by low aerobic capacity level, high-class of strength and flexibility, with a high body mass index.

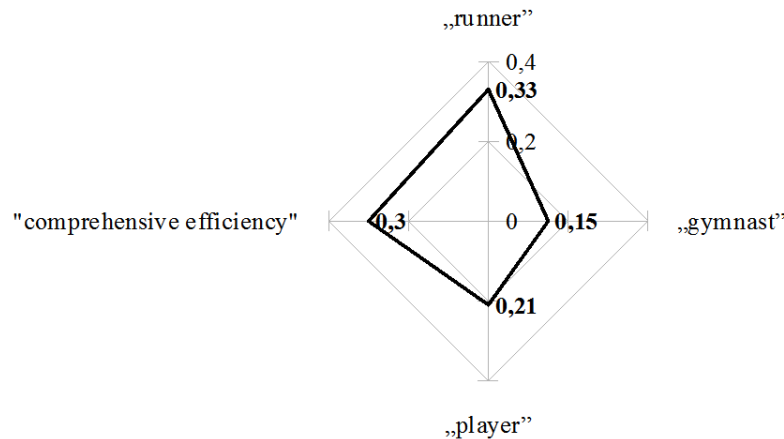


Figure 8. Models of health-related efficiency group of women

DYSCUSSION

Researchers agree that a comprehensive program combining exercise flexibility, strength and aerobic capacity gives the best results [2,3,5,7,8,9].

Present an older person poses a growing requirement. Both in everyday life and for practicing most forms of physical activity is required optimum level of muscle strength, which is not always typical for people aged 60+. It is known that regular exercise, particularly strength training meets a number of very important functions. Disturbing is the fact that 28% of men and 66% of women may have problems with weight lifting two kilograms after completing 74 years [6].

Due to the declining with age physical fitness in women after the age of 60 increases the need for action to increase functional independence in everyday life. There is therefore a great need to take measures for the prevention gerontology, focusing on improving and maintaining the necessary efficiency of locomotion and functional. Implementation research has allowed to create four models of health-related fitness in women aged 60-80 years. No intolerance symptoms of exercise during motor tasks and the positive reception of the battery of tests by the respondents can speak for the inclusion of tests from the Institute Aerobic Research (IAR) of Dallas as a simple research tool comprehensively evaluating the level of physical activity in the form of health-related fitness profiles as a reliable source of information and supplement to design gymnastics health-related training program. Worth emphasizing the importance of testing to facilitate the assessment of functional capacity, especially by instructors conducting classes with older people. The test will adequately fit the teacher training program to the needs of the group, that is, an emphasis on exercises aimed at improving major motor skills. When designing a program of physical exercise, be aware of an individual approach to each of the students of the elderly, and realizing it, you should constantly observe each participant. The authors emphasize that these studies are a prelude to the more detailed analysis and predict on detailed studies in the future focusing on specific motor skill.

CONCLUSION

1. The largest group of the women (34%) represents a "runner" model of efficiency, probably this result is associated with earlier forms of activity undertaken by the most tested in the youth-based, such as running, cycling or swimming, which in the present lose interest in the present to nordic walking, which prefers 23% of the women
2. The main themes that motivate older women to regular participation in physical activities are prevention of diseases of joints (66%), increase the body's resistance (60%) and improved good mood (53%)
3. Top-developed motor skill was aerobic capacity (58%) and flexibility skill (42%) and the weakest one are muscle strength (24%)
4. The largest features difference was observed while trying to investigate the abdominal muscles strength and flexibility, and high uniformity was noticed while attempting aerobic capacity test
5. The research results helped create four health-related fitness profiles for each individual test and characterize the model group at a later stage which allows for individualized training effective health
6. In the case of this study women's group should focus on strengthening workout main muscle groups because the test checks strength skill level showed the weakest results.

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