FUNCTIONAL TRAINING - MEANS OF OPTIMIZING BODY COMPOSITION

Antrenamentul funcţional- mijloc de optimizare a compoziţiei corporale

HARJA Georgiana-Elena*
National University of Physical Education and Sports, Bucharest, Romania
* Corresponding author: harja_georgiana@yahoo.com

Abstract
Background. Research on the composition of the human body dates back to antiquity. In 440 BC, Hippocrates promote the idea that the human body is composed of four humors. A similar theory was also supported by Chinese researchers, suggesting the existence of five elements in the human body, and health is the consequence of a balance between them. These theories do not have a scientific foundation, but can be taken as a reference point in the history of research on body composition.
The assessment of body composition provides important data about the person health, especially the body mass index. If it is not within certain parameters it may indicate the presence of a disease.
Functional training is a physical conditioning activity with beneficial results in reducing body weight by decrease body fat and increasing strength and strength indices.
Objectives. This study aims to analyze the influence of functional training on body composition at a group of subjects after a five-month exercise program.
Methods. Experimental research was conducted on a group of 40 female subjects aged 19-25, between October 2017 -February 2018. The evaluation was performed using a body analysis tool that provided data on the body mass index and percentage of muscle mass and adipose tissue.
Results. The results demonstrated significant differences between initial and final testing, these data confirming the effectiveness of the exercise program used.
Conclusions. Functional training is effective only if the effort is adequate and the exercises are appropriate to the physical condition of the participants.

Keywords: body composition, functional training, muscle mass, body mass index

Introduction

Research on the composition of the human body dates back to antiquity. In 440 BC, Hippocrates promote the idea that the human body is composed of four humors. Also in Greece is the famous opera, Doryphorus, of the sculptor Polykleitos, which represents the perfect proportions of the body. A similar theory was also supported by Chinese researchers, suggesting the existence of five elements in the human body, and health is the consequence of a balance between them. These theories do not have a scientific foundation, but can be taken as a reference point in the history of research on body composition.

The discovery made by the famous scientist Archimedes (287-212) is one of the most famous hydrostatic laws. And it has numerous applications in different areas. Considered to be a starting point for underwater weighing.

A short chronological sequence of studies on body composition:
• 1863 E. Bischoff analyzes the water content of human dead body;
• 1871 J. Quetelet Belgian scientist, BMI inventor;
• 1896 H. Katz studies the chemical composition of the muscles;
• 1909 W. Coleman discovers a link between creatine levels in urine and muscle mass index;
• 1916 D. Bois discovers the equation that determines the body surface;
• 1963 first symposium on body composition;
• 1968 first book on this topic, etc.

The study of body composition is essential for specialists in various fields to research the human being. From the above-mentioned data, we can see that preoccupation existed hundreds of years ago. Similarly in every field, due to the evolution of the technique, the research has expanded more and more so that the new information has contributed to the appearance of a large number of articles, books and congresses on this subject. This may suggest that the subject is still developing and can be regarded as a distinct discipline in the future.

Health status and body composition

Medical studies highlight a link between body composition and various conditions. A high percentage of adipose tissue is associated with the risk of developing metabolic diseases: 2 diabetes, obesity or cardiovascular disease**.**

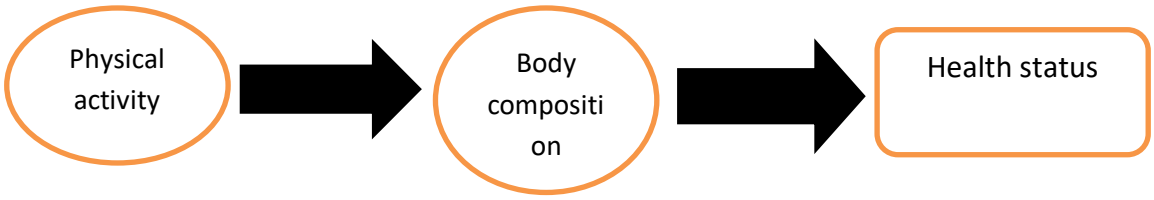
BMI greater than 30 is an aggravating factor for cardiac morbidity, and other people with chronic illnesses regardless of age or gender.

BMI below 19 in women and less than 20 in men may also indicate the presence of certain diseases (hyperthyroidism, eating disorders, hormonal disturbances, etc.). Other effects of a deficient body composition include low immunity, vicious body attitudes, low work capacity.

An imbalance of BMI, under or over, normal values may affect the health and physical condition of the person.

Based on body composition, we can also make classifications of the three constitutional types:

• Mesomorphic, athletic constitution with well-developed muscular mass;
• Endomorph, robust type, predominates adipose tissue;
• Ectomorph, longilin type with poorly developed muscles



Assessment of body composition

The methods for determining a body composition are numerous, but only two of them have been scientifically validated: hydrostatic weighing method and X-ray measurement method, DXEA (dual energy X-ray absorption). In sports practice they are less used due high costs. Other effcient methods are the measurement of adipose tissue and bioelectric impedance (BIA), a method used in this paper.

Physical activity, functional training

To achieve daily demands, the human body has to be trained by physical activities that require its muscular, respiratory and cardiovascular system.

This work focuses mainly on functional exercises as a means of improving the muscular and energetic system. Exercises providing benefits in the short term, but the most significant changes are those over a long period of time: increasing the active mass by improving strength indices, improving vicious bodily attitudes, improving immunity, weight loss by lowering body fat.

Some research points out that decreasing by more than 1 kilogram a week with only a calorie restricted diet is not possible because the loss consists of water and active mass.

Functional training was initially designed for the physical recovery of athletes. Over the last 20 years it has become more and more popular, and it is currently in continuous progress. In any exercise, emphasis is placed on the position of the body movement, and implicitly on the stabilizing muscles, it is also important to involve as many segments as possible, and depending on the individual's particularities, the exercise is adapted to facilitate preferential work on certain parts of the body that are deficient (esthetic, functional, motric).

A study published in the 2009 in Journal of Strength and Conditioning Research made a comparison between classic strength training and functional training. The results of the study showed obvious benefits for the group of subjects who had functionally trained compared to the other group. Subjects in the first group had a 38% increase in strength compared to the classic trained group.

Objectives of the paper

This experimental study aims to analyze the influence of functional training on body composition in a group of subjects after a five-month exercise program

Methods

Experimental research was conducted on a group of 40 female subjects aged between 19 and 25, between October 2017 and February 2018, with 1 and 4 sessions per week. A total of 30 subjects are students of the University of Bucharest, and 10 are members of the PilatesGym gymnastics club.

The basic part of the training program applied to the subjects consists of aerobic exercises from different disciplines (athletics, martial arts, dancing) with a 40 "active work and 10" active break; and exercises to tonify the main muscle groups, dosing - 2x8 reps.

Evaluation was performed objectively using a body analysis tool that provided data on body mass index, percentage of muscle mass and adipose tissue.

Table 1: initial test values

The IMC average	The average percentage of fat percentage	The average percentage of muscle mass	The average of age
21,9	28,9%	27,93 %	22 years

Table 2: Final test values

The IMC average	The average percentage of fat percentage	The average percentage of muscle mass	The average of age
21,11	27,76%	28,43 %	22 years

Results

Of the total of 40 subjects, most normoponderal except one subject with grade I obesity (BMI - 35) and four underweight subjects.

The differences between the initial and the final values are: for the percentage of adipose tissue: -1,14; muscle mass percentage + 0.5 and for BMI: - 1.14;

The results showed significant differences between initial and final testing, these data confirming the effectiveness of the exercise program used.

Conclusions and recommendations

- the program presents a combination of cardiovascular exercises combined with toning exercises of the main muscle groups;
- during training, subjects had active breaks with breathing and relaxation movements;
- in the cool down, the subjects did stretching exercises, breathing and analytical relaxation;
- training is effective only if the effort is adequate and the exercises are appropriate to the physical condition of the participants.

References

Bota, A.,(2006), Exercitii fizice pentru viata activa, Bucureşti, Cartea Universitară
Dragnea, A. Bota A.,(1999), Teoria activităţilor motrice, Bucureşti, Editura didactică şi pedagogică
Lukaski, H., (2001) Body composition in exercise and sport, CRC Press
Macovei, S., (2003), Gimnastica aerobica de înteţinere, Bucureşti, Editura Afir
Nicu, A.,(1993) Antrenament sportiv modern, Bucureşti, Editis
Nicolae N.(2012) Culturism şi fitness, Târgu Mureş, University Press
Popescu, G.,(2005) Impact aerobic, Bucureşti, Elisavaros
Stoica, A., (2004) Gimnastică aerobică. Fundamente teoretice şi practico-metodice, Bucureşti, Editura Bren
***https://academic.oup.com/ajcn/article/41/4/810/4691611