

**MINISTRY OF NATIONAL EDUCATION
NATIONAL UNIVERSITY OF PHYSICAL EDUCATION AND SPORT**

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**ABSTRACT OF THE DOCTORAL THESIS
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TITLE OF THE THESIS:**

***APPLICATIONS OF BODYBUILDING EXERCISES TARGETING BODY
RESHAPING FOR STUDENTS ENROLLED IN NON-PHYSICAL
EDUCATION STUDY PROGRAMS***

The idea of the close relation between mind and body, like fundamental idea of Greek education, has become a cultural and educational ideal of most teaching classical and modern schools. Remodeling is an action of shaping the human body through specific activities.

The human individual reshapes permanently his body by practicing physical activities. The autoplasic feature derives from the individual's desire to harmoniously develop the body, which also influences his perception and the others' perception by creating a superior image of him.

Bodybuilding and fitness have specific physical exercises whose action is strictly segmental and localized on groups of muscles or a single muscle, their action being especially on muscle strength.

The physical condition is considered an indicator of youth and vitality and is desired and appreciated both in professional and in everyday life. A body shaped after some existing templates in a certain period of the evolution of society is desirable for most individuals. This physique is possible through physical exercise which can interfere with objective stimuli on certain body segments or on the entire body.

Choosing this research topic is due to the fact that young people should pay attention to their own body, their harmonious development and to maintain a correct posture throughout life, bodybuilding being one of the subjects I teach at the University of Tg-Jiu.

Bodybuilding is a discipline that defines its field by using specific means - free exercises with weights or machines and also includes a number of associated means, borrowed from other sports such as gymnastics.

Unfortunately, physical education and sports in higher education has suffered a decline in recent years, not being so important for the graduation of a student and requesting a Pass/Fail evaluation. This situation demotivates students, so the students of Constantin Brancusi University of Targu-Jiu are satisfied with poor tests results.

The causes of the decay of physical education and sports in higher education are violation of regulations, including a large number of students in a group, inadequate evaluation of students and rigidity of programs.

Also, most studies concerning human body remodeling by means of physical education and sport mainly refer to females.

Contrary to what is assumed that only women are interested in a pleasant physical appearance, social practice reveals a great attraction to a beautiful and healthy body especially among males who go to fitness clubs and gyms.

The research purpose is to guide students enrolled in non-physical education study programs to an active lifestyle through exercise, directing them to bodybuilding in order to develop the muscle strength, which will improve their physical condition and will be reflected in the quality of a better life.

Physical development of young people presents an interest today that's why we focus on students in the first year of college, biological significance of indices and parameters determining a good health status, reason for which we intend to demonstrate the need for using specific means of bodybuilding as a form of body care and selective influence on the musculoskeletal system and as an effective body reshaping.

We want to measure the effectiveness of programs used in physical education class, such as bodybuilding and fitness by using the means and methods proposed for achieving functional and somatic indices, motric capacity and prevent of physical deficiencies or correction of vicious posture.

We also plan to investigate the level and quality of some exercises, to know each student's development parameters which will lead to the fulfillment of the overall objectives of physical education. This has been possible through use of the device Inbody230 which provided us with accurate information on the students' body composition investigated in our research; they stand at the basis of the exercise programs and at a faithful observation of the subjects' evolution for an effective body shaping.

The thesis presents three parts, the first part deals with theoretical, methodological and conceptual concepts of physical education, bodybuilding or body remodeling through exercise.

PART II PRELIMINARY RESEARCH ON THE STUDENTS' OPTIONS ENROLLED IN NON-PHYSICAL EDUCATION STUDY PROGRAMS DEALS WITH THE ATTRACTIVNESS OF PHYSICAL EDUCATION CLASS.

Preliminary research

In order to justify the introduction of specific means of bodybuilding in physical education class for students enrolled in non-physical education study programs of Targu-Jiu, we conducted a survey through conversation and questionnaire which gave us useful information for further research.

50 male students enrolled in non-physical education study programs who have been trained to complete the questionnaire were interviewed and included in the sociological survey during May-June 2013. The questionnaire aimed to detect students' interest in motric activities during physical education class or their expectations for practicing various physical exercises.

The main purpose of the survey was to determine how popular bodybuilding is among students and the possibility of introducing this discipline in physical education classes.

These 50 subjects, aged between 18-22 years were evaluated in terms of anthropometric in order to be part of the research. Criteria for inclusion in the experiment group were established in accordance with their answers and preferences arising from the sociological survey.

The evaluation of the preliminary research consisted in measuring weight and waist for finding the body mass index and calculating the waist-hip ratio. Waist-hip ratio is more and more used particularly in the health field for predicting the risk of cardiovascular or metabolic diseases.

Inclusion criteria established for the experimental research:

- Aged between 18-20 years,
- Body weight index < 30,
- Blood pressure and heart rate concerning their age,
- No neuromotor disorders,
- Participants to physical exercises,
- Participants that respect the imposed rules imposed by the appropriate conditions thus limiting errors.

Exclusion criteria established for the experimental research:

- Metabolic syndrome,
- Diabetes,
- Neuromotor pathology,
- Hypertension,
- Orthopedic disorders,

- Subjects participating in specific sport training programs

Conclusions of the preliminary research

1. Most studies concerning human body reshaping by physical exercises mainly refer to females. Contrary to what it is assumed that only women are interested in a pleasant physical appearance, social practice reveals a great attraction to a beautiful and healthy body especially among males who often go to fitness clubs.
2. The survey revealed that the lifestyle of students from Tg-Jiu is not an active one, even if some of them want to go more often to gym. Unfortunately, the financial situation and the lack of free time are the main reasons for not doing physical exercises.
3. Including bodybuilding exercises in physical education classes meets students' preferential opinions which represent 80% of the interviewed students.
4. Introduction of the discipline bodybuilding will solve two of the impediments encountered by respondents in practicing physical exercise namely to facilitate free access to fitness and to solve the tasks of physical education lesson. Also, according to the results of the questionnaire, the subjects want to have well-defined muscles, which will increase their self-confidence, with implications for their whole activity.
5. The preliminary research enlightened us on the composition of the experiment group, out of the 50 interviewed and evaluated subjects, 22 respond to the inclusion criteria. Taking into account students' main options and anthropometric measurements, subjects with a body mass index bigger than 30 have been excluded from the final research. These subjects took part in the physical education classes and benefited of an individualized training program having the medical approval to do physical exercise, but they were not taken into account in the 3rd part of the research in order to make objective the intervention program.
6. The somatic evaluation provided useful data for the experimental group itself and for the content of work programs.

PART III PERSONAL CONTRIBUTIONS CONCERNING THE APPLICATIONS OF BODYBUILDING EXERCISES TARGETING BODY RESHAPING FOR STUDENTS ENROLLED IN NON-PHYSICAL EDUCATION STUDY PROGRAMS.

Research hypotheses

1. The subjects' body composition can be positively influenced by specific bodybuilding exercises targeting body reshaping due to the action on skeletal muscle and adipose tissue.
2. Components of students' physical condition can be improved by including bodybuilding exercises in physical education class.

Research structure

Since October 20th 2013, depending on their choices expressed at the beginning of the academic year, the subjects took part in the physical education classes once a week and were included in a specific training program which included bodybuilding exercises.

The programs were individualized according to each subject's weight, need and previous motric experience, pursuing two main objectives namely to reduce the adipose tissue and to increase muscle growth. The exercises aimed muscular hypertrophy that is why the workload was high. Each subject was given a worksheet where weight and dosage exercises were different depending on the objective (to increase muscle mass and / or to reduce body fat) at each meeting.

The subjects were tested before the training program and at the end of the experiment, aiming the progress.

After the test with InBody230 device, each subject was drafted an evaluation report according to which training programs were developed, this report indicating the need of each subject to decrease fat mass or increase muscle mass.

1. Physical education discipline has as main objectives, in higher education, the development of motric ability, harmonious physical development and maintenance of a state of optimal health, objectives that have been achieved in this research.
2. Subjects of most of the researches on body shaping by physical exercise are mostly females, although lately males go to gyms more often and are encouraged to become "metrosexuals", having a strong aesthetic sense and being concerned about their appearance.
3. Regardless the number and complexity of daily problems, a good physical condition gives satisfaction, increases muscle strength, positively influencing both aesthetic and functional youth aspect, many experts saying that the force develops at the age of 20-30 years, bodybuilding being one of the disciplines acting in this direction.
4. Introduction of the bodybuilding discipline solved two of the impediments encountered by respondents in practicing physical exercise namely to facilitate access to fitness clubs and to solve the tasks of physical education lesson.

5. By reports, work sheets and explanation of exercises according to individual capacity, students have acquired practical experience, awareness to practise this activity during their leisure time and strong motivations that can lead to practice these exercises even after the experiment.

Conclusions of the experiment

1. The impact of training programs on subjects of this experimental research targeted body reshaping, increase of muscle mass and improvement of segmentation perimeters which validated the hypothesis 1 of the research.
2. This impact was felt on physical condition, especially on muscle strength at arms, abdomen, back and legs, with evident progress as a result of practicing bodybuilding exercises in physical education class.
3. Significant improvements could be noticed at the abdominal level at the final testing period compared to the starting testing period for all parameters (abdominal obesity, abdominal strength, abdominal perimeter) which confirms the effectiveness of the implemented training programs.
4. The resistance training can increase muscle mass which leads to an increase in body weight. Another benefit of this type of training allows caloric intake based on the use of body fat, the metabolic rate increases because cell mitochondria produce energy in the muscle and therefore consumption of calories. More muscle cells mean more mitochondria leading to caloric intake.
5. Understanding the relationship between body composition and health is important for organizing any fitness program. All this requires:
 - create a fitness profile for each individual, in our case the body composition as a component of fitness with cardiovascular, muscular and respiratory fitness.
 - monitor changes in adipose and muscle tissues along with participation in the training program.
 - correlate body composition with nutrition recommendations.
 - correlate evolution of body composition with growth, development and age.
 - maximize human performance by reshaping and monitoring body composition depending on specific requirements.
6. The final configuration of the subjects can be classified in one of the 8 types of body composition: weight loss, increased skeletal muscle mass, decreased fat mass.

This means that there was a body reshaping based on good muscle development and physical exercise in which energy was supplied by adipose tissue and which also included increased use of fat-soluble vitamins, and thus increase of nutritional status. This absorption consolidates cell membrane and lipoprotein layer which reduces the loss of minerals, protein and thus the cell preservation.

7. In the current study we have to emphasize the role that knowledge and monitoring of body composition have in close relation with the type of effort, the latter not being definitive, other factors related to diet, type of metabolism, body constitution being involved etc.

The physical appearance of individuals is a very important concept especially among young people. Our approach came to support this aspect by identifying the subjects' needs in terms of body reshaping. The subjects have been involved in individual training programs efficient for body composition and development of muscle strength.

Using of modern technology to quantify the effects of physical exercise on students' body by using InBody230 device in order to determine body composition makes the research interdisciplinary which will be further exploited and extended to other researches for different sports branches.