

## Research article

### Increasing the Level of Female University Students' Physical Fitness by Fit Boxing

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#### Abstract

The purpose of the research is to explore and experimentally verify the effect of boxygen classes on women fitness in pedagogical higher education institutions, namely, Hryhorii Skovoroda University in Pereiaslav (Ukraine). The study involved 37 respondents. Based on a mixed-method research design, our research studied the effectiveness of fit boxing both qualitatively, and quantitatively through the use of theoretical analysis; sociological and pedagogical meth-

ods; the methods of mathematical statistics; the constant, formative, and control experiments. The experiment had three stages: the first stage: motivational and diagnostic; the second stage: educational and developmental; the third stage: control and summative. There are some reasons to suggest taking up fit boxing for young women, the most important one is to be strong and resilient because of the Russian-Ukrainian war on the territory of Ukraine. A girl must take care of herself by developing her self-defence skills as well as keeping fit for future professional and social activities. The level of women fitness in wartime must be higher than ever. Boxygen helps also to release negative emotions and reduce stress. The authors state that a number of benefits for female University students can be derived from fit boxing.

**Keywords:** Physical education; Self-defence Fitness; Fit Boxing; Boxygen

#### Introduction

Nowadays, the improvement of the system of physical education in higher education institutions is of primary importance. The fact is that modern students need access to current innovative technologies, which can help them to develop their physical fitness. According to recent reports, up to 80% of students have health problems, 30-50% of them have unsatisfactory level of physical fitness [1,2].

There is a problematic situation in the physical education. The problem is that there is a contradiction between the level of modern social requirements and the level of physical fitness of students. This is due to the fact that the majority of students do not worry about their physical fitness. They have no strong desire to do physical exercises regularly; consequently, there is the negative dynamics of indicators of physical fitness of students during their study in higher education institutions.

The above determines the need to find new approaches to improve the educational process of physical education in higher education institutions. The Ukrainian scientists [3,4] devoted their research to the study of the problem of physical education in higher education institutions. Mostly, they recommended sport games, moving games, and eastern health systems for students. As they noticed, the other exercises, including boxing, tend to decrease.

For the purpose of self-defence, a number of [5-7] recommend using various types of martial arts at physical education classes, which is very popular among the young people now. The reason for increasing the level of physical fitness in wartime is relevant not only for men but also for women. As a means of forming of students' physical skills, boxing is in physical education classes in some higher education institutions. However, the vast majority of female University students do not like boxing as a sport because of its aggressiveness and trauma.

Therefore, today fit boxing or fitness boxing can be one of the promising directions. It is training for a group of people. It includes aerobic exercises. The essence of training consists of rhythmic

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punches and kicks on a hanging bag. The main difference between fit boxing and regular boxing is the absence of contact battles.

Many scholars hold the view that boxing is an organic combination of high physical fitness, stable techniques, flexible and diverse tactics and great willpower of a young person [8-10] We should state that women's boxing is a sport that was banned until recently in most countries of the world. However, in 2009 it was included in the program of the Olympic Games that gave a motive to its active development. The specifics of women's boxing in some sense differ from men's by higher level of safety, as well as the modelling of women's boxing classes taking into account the general characteristics and peculiarities of the body of the weaker sex.

The analysis of sports results in the international arena recently has shown the high achievements of domestic boxers, which is due to the serious educational and methodological base of boxing in Ukraine. Boxing as a form of fitness service is quite popular in the USA – the birthplace of fitness, the country that is the flagship of the global fitness industry. The latest statistical data show the growing popularity of boxing as a physical education and health service in the field of fitness in different countries of the world. The analysis of scientific data, pedagogical observation, and survey of experts in the field of fitness showed that currently a wide range of methods and tools for sports activities of boxers of various qualifications were used in the process of boxing training sessions with clear physical culture and health-improving features. At the same time, there is no competitive activity in the traditional form. That is why; the term 'boxygen' was formed and firmly established in scientific and fitness terminology. As a result of analysing the scientific research, we can determine boxygen as a kind of combat sport of the health fitness system that has a clear methodical basis for training boxers. Boxygen can improve physical and mental health, as well as correct the body and satisfy the need for physical activity.

The analysis of scientific and methodological literature shows that main attention is paid to the study of educational and training activities of men boxers; however, the publications on women boxing are extremely insufficient. In Ukraine, boxygen has been developing in the field of fitness services for a long time, and its popularity is growing every year. But there are hardly any complex scientific studies of the problems of women boxing, which slows down its development to some extent. There are hardly any studies of the impact of boxygen classes on the fitness of female University students, which became relevant for the choice of the theme of our experimental work.

**The purpose of the research** is to explore and experimentally verify the effect of boxygen classes on women fitness in pedagogical higher education institutions.

In accordance with the purpose, the research tasks are:

1. To analyse the state of the investigated problem in the scientific, methodological, and special literature.
2. To justify the methodology of using boxygen classes in the physical education of female University students in pedagogical higher education institutions.
3. To check experimentally the effectiveness of boxygen classes on the physical fitness of female University students.

## Materials and Methods

We applied the following research methods:

- theoretical analysis of the problem based on the study of scientific literature on pedagogy, psychology, theory and methods of physical education; analysis of State standards, and pedagogical practice;
- sociological methods – surveys, conversations, questionnaires;
- pedagogical methods – pedagogical observation, testing, pedagogical experiments (constant, formative, control);
- the methods of mathematical statistics were applied in order to generalize the quantitative indicators of each group, as well as to determine the differences between them, namely: the arithmetic mean ( $\bar{x}$ ), the standard error of the arithmetic mean ( $S\bar{x}$ ), the estimation of the general arithmetic means by sample means and the reliability of the differences between them were determined using  $t$  – the criterion of the Student.

## Participants

The basis of the research was Hryhorii Skovoroda University in Pereiaslav. The participants were female students of the Faculty of Historical and Social-Psychological Education. 37 girls aged 17-18 (first-year and second-year University students) took part in the experiment. They were divided into two groups – the experimental group – 18 girls, and the control group – 19 girls.

## Results

In general, boxygen is a combination of functional training, basic boxing techniques and exercises for the special physical training of a boxer. Boxygen includes classes for female University students using exercises from the boxing arsenal combined with modern moves from fitness technology. This kind of combination of boxing exercises, modernized and combined with modern exercises from fitness technologies, contributes to increasing the motivation of female students to engage in physical education and sports; the formation of boxing skills and abilities, which will contribute to the formation of applied self-defence skills, as well as prepare physically for future working and social activities.

The popularity of boxygen is due to the following core advantages:

- promote effective weight loss;
- help to improve self-defence skills, posture, coordination, and balance;
- reduce stress and other negative emotions;
- develop character and willpower;
- strengthen the muscles of the body, speed abilities, and endurance;
- help to concentrate;
- improve visual-motor coordination;
- have a positive effect on mood;
- increase self-confidence;
- Involve in sports lifestyle and an active life position.

Specialists compare boxygen with 'light boxing', because it differs from classic boxing in a number of features:

1. Punches are given to a hanging bag, which is lighter than the other.
2. There is no contact combat in the ring, unlike classic boxing. There is no ring. The participants do not take part in sparring.
3. All exercises are aimed at burning calories, as there are a lot of dynamic rhythmic jumps and punches.
4. Intensive aerobic training alternates with strength exercises, which is good for training endurance.

The experimental methods of introducing fit boxing into the physical education of female University students consisted of three stages: The 1<sup>st</sup> stage was motivational and diagnostic. It included an assessment of the initial level of physical fitness of female University students, surveys, and determination of motives and problems for regular exercise classes.

The 2<sup>nd</sup> stage was educational and developmental. It included the development and implementation of the content of the fit boxing program to improve the fitness of female University students, teaching the basics of the techniques of fitness boxing and boxing aerobics, and improving the physical fitness of students.

The 3<sup>rd</sup> stage was control and summative. It included the improvement of the general and special physical fitness of female University students. Diagnosis of the formation of physical fitness of female University students was carried out.

According to the results of the survey, it was determined that the main reasons for the reluctance of female University students to do physical exercises are: the monotony and uninterestingness of the equipment in physical education classes, the lack of sports and physical culture and health sections, the insufficient material and technical base of the university, weak methodological background for independent physical culture and health classes, lack of free time. However, the majority of respondents (72.6%) of girls were interested in a new sport – boxygen. They expressed a desire to take it up.

In the course of the boxygen classes with female students of the experimental group, at the first stage of classes, it was explained that boxygen was a sport that taught a person, first, to protect himself and, if necessary, respond to 'evil'. It also promotes harmonious physical and psychological development. At boxygen classes, you can get rid of mental tension and aggression. Boxing classes in combination with fitness exercises help to increase the motivation of girls: to do regularly physical exercises; control their psychological and emotional state; adequately assess various life situations, and be ready to face them. The students were recommended to engage in boxing in combination with fitness, including online training, to maintain their psychological and physical conditions.

As a rule, warming up at boxygen classes is done using box aerobics. A-box is a kind of health aerobics. It has appeared recently (nearly 20 years ago). The idea of its implementation belongs to Yvonne Lynn, an ex-champion of the world in contact combat. Box aerobics combines aerobics and martial arts. Thanks to the fast work of the muscles, high intensity of the classes, muscle toning occurs correctly and quickly, strengthening the body and developing dexterity. The musical accompaniment in the warming-up was selected according to

the assignments. It is necessary to take into account: the difficulty of performing the technical elements of fit boxing, the level of physical and special physical preparedness of female University students, the stages of learning technical elements of self-defence based on boxing, the need to maintain the interest and emotional background of students.

The core training lasted 40 minutes. The students improved their skills and abilities in physical actions of fitness boxing.

The program included the following materials:

- training in technical actions of defense and attack in boxing;
- combination fitness technologies with a combination of boxing punches, namely, a series of low-amplitude tempo movements – jab (a direct punch), hook (a side punch), uppercut (a bottom punch) with a constant change of position, and various movements imitating the actions of a boxer in the ring;
- formation of the technique of adopting the main stance in boxing;
- formation of the technique of holding hands in the main stance of a boxer with dumbbells with a step on the step platform and back; simulation exercises in boxing (battle with a shadow); technical actions on hanging bags;
- formation of psychological stability in stressful situations;
- General physical training and special physical training.

All exercises of the main part were also done in combination with light music. However, it should be noted that until the common basic technical elements of doing exercises by female University students were formed, the musical background was not connected. We made sure that the fit boxing exercises corresponded to the general technical structure. Only then, they were done to musical accompaniment.

The final part of the class (up to 20 minutes) was devoted to working on technical errors, the development of physical qualities that had low indicators. We provided individual homework for students to adjust their individual indicators of physical fitness during extra class time. We started the warming-up with running, walking, and 'stretching' gymnastics.

The certain level of general physical fitness and basic level of technical fitness of female University students made it possible to move to the next educational and developmental stage of training. In this case, the main task was to increase the level of physical fitness of students by means of boxygen. This stage lasted for three months. The special physical qualities included high coordination of movements; special endurance; quick reaction, which was manifested in striking actions, methods of protection and in movements; and special power qualities.

The development of coordination abilities took place during the study and improvement of individual movements on punching bags, with a rope and especially in individual classes with a trainer, using boxing gloves or sparring gloves with a change of distance, when carrying out a certain method of defense and maneuver. The use of boxing aerobics at the beginning of the class, and the various new technical techniques in movement and music was an effective means of developing dexterity and a sense of rhythm.

The development of strength qualities was made by doing exercises with a hanging bag, punches with dumbbells (the bottles with sand up to 1 kg) in the hands; twists of the trunk in the sitting and lying position; exercises on gymnastic equipment in hangings and stops; exercises with weight on blocks in the form of push-ups, pull-ups and inclines. In order to develop the strength of the hands and forearms, we did the exercises with dumbbells, stuffed balls, and maces. The best practice to develop speed was so-called exercise, such as ‘the battle with the shadow’, which was done with the maximum speed. We also developed speed by hitting the hanging bags, freestanding bags, and sparring bags. For the development of speed and general coordination, we practiced sports (tennis, table tennis, basketball, handball, etc.), and active games.

During the training, we developed a special endurance, i.e. the right respiratory capacity, the ability to combine tension with relaxation, rational using the technique and minimal nerve tension while taking boxygen by means of improvement of movements.

We gradually increased the duration of boxing-aerobic warming-up, and practiced the battle strikes with a hanging bag or in boxing gloves under the guidance of a trainer. We did many exercises with punching bags. The interval training was used to develop high-speed endurance. After the aerobic warming-up, the students improved their individual techniques during the first three rounds. They did it at a quite high pace with a one-minute break between them (work on target tasks). After a 3-5 minute break, the students had a free ‘battle with the shadow’ then there was another break. After that, the students did the exercises with a rope, and one round with a hanging bag or in sparring gloves.

Boxygen classes teach not to attack, but rather to defend. There is no sparring here. For any exercises, the starting position was a boxing stance. All punches were brought out with the help of small dumbbells. At the end of the classes, they did stretching and the so-called ‘warrior dance’, which could help to relax muscles and to restore respiratory capacities.

If in the first stage of training the main means was aerobics-boxing which included aerobic steps, aerobic movements, and dance elements, then in the second and third stages, boxygen-type training was used, where the greatest attention was paid to boxing techniques, and the development of physical abilities. Each movement was worked out in stages, with gradual complication and acceleration of the tempo. In addition, great attention was paid to strengthening the spirit, increasing psychological stability, and developing the ability to focus to the maximum while giving and taking punches.

In the process of the experiment, we used the control system, which ensured instant and constant monitoring of the physical state and body’s reaction to the capacities of female University students. The intensity of the charge depended on the initial level of fitness of the students and the current functional state during the class. The female University students of 17-19 years old who had a physical state below the average level were recommended to do light physical exercises with an intensity of 40-50% of MSK and a heart rate of 130-140 beats per minute. At an average level of physical state, the intensity of the physical training was 50-60% of the MSK, the training pulse was 140-160 beats/min. During the period of the ovulatory-menstrual cycle, special attention was paid to the girls’ training: the intensity of the charge was reduced, the exercises with body shaking (jumping, squatting, etc.), and all exercises with weights were

excluded. However, on such special days, they worked on the development of flexibility and practiced the technique of movements in boxygen at a low and medium pace.

We conducted a control pedagogical experiment in order to check the effectiveness of the suggested method of using boxygen in the process of physical education of female University students. The purpose of the experiment was to identify changes in indicators of the development of physical abilities of students under the influence of boxygen. After the implementation of the experimental program, we conducted retesting to identify changes in the level of development of the physical abilities of female University students who participated in the experiment. Pre-test and post-test assessment results are shown in the tables below (Table 1).

No	Indicators of physical fitness	Pre-test assessment results		Post-test assessment results		P
		CG n= 18	EG n= 19	CG n= 18	EG n= 19	
1.	Running 100 m (sec.)	17,56+0,33	17,61+0,41	17,18+0,57	16,49+0,82	≤0,05
2.	Running 500 m (min.)	2,49+0,08	2,48+0,07	2,44+0,12	2,27+0,09	≤ 0,05
3.	Flexion and extension of the arms at a stop (times)	9,17 ± 0,21	9,15 ± 0,28	9,48 ± 0,48	13,77± 0,59	≤0,05
4.	Standing long jump (sm)	151,2±5,27	152,3±4,92	156,1 ± 5,69	173,1±5,41	≤0,05
5.	Shuttle race 4*9m (sec.)	11,29±0,31	11,32±0,45	11,23 ± 0,48	9,35 ± 0,52	≤0,05
6.	Trunk inclination from the initial standing position (sm)	8,13 ± 0,29	8,17 ± 0,47	8,95 ± 0,51	9,87± 0,59	<0,05

**Table 1:** Dynamics of physical fitness and work capacity of female University students of the control and experimental groups ( $\bar{x} \pm \sigma$ ) Quantitative research is generally associated with the positivist paradigm in the experimental groups.

CG – a control group;

EG – an experimental group

## Discussion

Retesting of indicators of the level of development of physical abilities was carried out for all participants of the experiment. The results of the control experiment showed that the effect was achieved by both groups of female students who were engaged in physical culture during the academic year – both the girls who chose boxygen and the girls who chose other types of physical activity in extra class time.

The main indicators of fitness increased both in the control (by 0.53-10.09%) and in the experimental (by 6.36-50.49%) groups. At the beginning of the experiment, no significant differences were found in the students of the control and experimental groups ( $p \geq 0.05$ ), however, after the experiment, the positive changes were found in the students of the experimental group in almost all test exercises, which had statistically significant dynamics in comparison with the control group ( $P < 0.05$ ) (Table 1).

The analysis of the results of the control stage of the study showed that the results of the strength abilities of female University students of the experimental group received the greatest increase – 50.49%; flexibility – 20.8%; dexterity – 17.4%; speed and strength abilities – 13.66%; ( $P \leq 0.05$ ), which substantiates the possibility and expediency for female students of higher education institutions to use fit boxing tools in the process of physical education. This fact is due to the specifics of the fit boxing tools and the conscientious studies of female students of the experimental group both during their offline studies at university and individual training during online studies.

The obtained data show that the majority of participants of the experiment who did fit boxing exercises, both in physical culture classes and in extra class time, ensured the development of basic physical qualities, increased the functional capabilities of the body, and enjoyed doing exercises. This allows us to state that the exercises were right and they had a positive effect on the well-being of female University students who were engaged in fit boxing.

## Conclusion

The results of the comparison of the final results between the experimental and control groups prove their significant difference ( $p < 0.05$ ). We obtained the results that confirmed the effectiveness of the method of using fit boxing for female students of pedagogical universities in the process of physical education. This study may contain the useful material for the development and implementation of specific conditions of women fit boxing in other higher education institutions.

## Statement of Ethics

This study was conducted in accordance with the World Medical Association Declaration of Helsinki. The research protocol was reviewed and approved by the Council of the Faculty of Physical Culture, Sports and Health, Hryhorii Skovoroda University in Pereiaslav / Kuybida Vitalii – PhD in Biology, doctor of historical sciences; Kotsur Nadiia – Professor, doctor of historical sciences, Panhelova Nataliia – Professor, Doctor of Sciences in Physical Education and Sports; Kokhanets Petro – Associate Professor, PhD in Physical Education and Sports / №1, September 11, 2023, Pereiaslav, Ukraine/. All participants provided written informed consent to participate in this study Increasing the Level of Female University Students' Physical Fitness by Fit Boxing.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the research, authorship, and/or publication of the article: / Increasing the Level of Female University Students' Physical Fitness by Fit Boxing.

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