



FITNESS EDUCATION FOR STUDENTS IN THE DISCIPLINE "SPORT"

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ABSTRACT

Fitness, as the Sport discipline in a non-governmental higher education institution, is a major discipline in the Sofia University's program, and physical training is an essential component of the general culture of young people. The main goal of the sport activities at the University is to stimulate such values in students as physical, mental and social well-being in order to improve human resources for life. The article examines the physical and functional development of 138 students from Sofia University, practicing fitness, by applying a new methodology for fitness training. The aim of the study is to reveal opportunities for development of physical qualities and motor skills and habits, as well as learning about healthy lifestyle and physical improvement. The analysis of the results of the research is done in three main directions – anthropometric indicators, physical and functional capacity, which are related to the set tasks of the study. The core averages provide information on the reliability of the individual statistical parameters of the study, and the comparison indicators are established by the Student's t-criterion and the Wilcoxon t-criterion.

Key words: fitness, students, training, Sofia University

INTRODUCTION

A series of international documents reflect young people's needs for sport activities in recent years, they also provide an opportunity for people to practice sports according to one's needs and physical condition.

Sport is a widespread social phenomenon, an important component of physical culture and the main means and method for physical education. Through sport, one explores one's physical capabilities and unlimited will power. By practicing a sport, a person is allowed to prove himself, win against time, overcome the force of a given resistance, his opponent, as well as himself. (1).

The term *sport* is defined in science as follows: A form of physical and mental human activity, which is purposefully chose, is thought in an organized manner, and is based on specific principles and rules for achieving different

purposes (health and vitality, psychological and physical efficiency working capacity, developing and sustaining the body and spirit, creating social contacts, personal, work or social prestige, exploring nature and human abilities, achieving material and financial benefits, and others) on the basis of competitions (races) against others or oneself". (2)

Under this definition, sport unites the different types of sport according to their common features. Every sport, however, has its own specifications.

For fitness there are two main aspects which need to be closely looked at – aesthetic and health. Through regular fitness practice a person develops a well-built athletic figure, excellent overall physical condition, harmonic development of all the organs in the human body.

The main points of fitness are two – Health and aesthetics. With regular fitness training an athletic figured is achieved, excellent whole-body physique, a correct development of all

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body organs and systems. Fitness is also accessible for all age groups.

Of course, physical improvement is not achieved only by fitness exercises, but compared to other sport disciplines in fitness the issues finds its direct and optimal solution. Qualities necessary for a given sport are acquired through active exercise of specific muscle groups and functional systems, but the main aim of the exercises is the high sport results. In fitness, a unilateral physical development, which is more or less a characteristic of other sports, is avoided. Fitness education allows one to find the most favorable training regime for increase of strength, loss of redundant body mass, adjusting of appearance of a certain body part, etc. This is where fitness gets its strong gravitational force and also the reason why fitness has become so popular and has been acknowledged in recent years by people of all ages.

When fitness is compared to other types of sport however, it should not be compared directly. Furthermore, it successfully complements them. Fitness should successfully develop in children and youngsters an excellent physical preparation, with which, they can easily grow to be the future best ones in other types of sport (3). And to physically active people it is an excellent means to improve their qualities in other sports. E.g: their strength training.

A big advantage of fitness is the not so difficult technique of the exercises. It doesn't require long time to learn and perfect complex moves or development of specific skills as it is with other sport disciplines. The risk of injury is also significantly reduced when using the right methodology.

Development of fitness as a type of sport is related to the social identity of a person, who transfers one's experience, knowledge and habits from generation to generation. Biological needs and natural strength acquired with birth which can be developed with the help of physical exercise are also taken into account.

Physical preparation presented in universities in the education discipline "Sport", is a main component of young people's general knowledge. Its goal is to establish in students values such as: physical, psychological and social well-being in order to improve human

quality of life. Care for health increases reserve capacity of the organism, stimulates professional capabilities of future specialists. When examining the future professional activities of students their health condition is taken into account.

The issue of maintain and improving student's health is becoming more and more prominent: The number of students with health ailments concerning the essential for life organs and systems in the body is increasing. The main causes for this are related to the lack of physical activities and extremely poor focus on forming and development of personally important qualities of students, their different abilities and capabilities, lack of direction for maintaining and improving a healthy lifestyle. Fitness as a type of sport is an important component in physical culture. By striving to achieve excellence in physical culture through exercise and sport, people develop skills to control their motion, apply their strength, plan actions etc. Through fitness they strive for physical perfection, which includes several components: optimal physical development, rich motor abilities, high level of physical training and work efficiency, increased organism resistance to the bad influence of one's profession and the environment. In order to achieve physical perfection, a systematic, over the years and purposeful physical education to one or several layers of the population is needed (4). In practice, however physical perfection cannot be achieved. Thus, It is more precise to say *physical improvement*. As a peculiar side of culture, physical culture has common and specific functions. The common functions, that are characteristic of culture as a whole, are aesthetic, normative and informational.

Aesthetic functions of physical culture are closely connected with their properties, which allow fulfilling people's needs for physical improvement, health and wholesome harmonious development. Fitness undoubtedly satisfies people's need for perfection in movement and a beautiful body. Aesthetic values for harmony of physical and spiritual development are also important.

While aesthetic functions concern beauty and accuracy of execution, normative functions are connected to creating and following exact norms, which can be evaluated – norms of physical readiness, physical capacity, norms for physical load, etc. These norms are a

standard for evaluating physical load, efficiency of efforts, usage of physical strength, and are oriented towards the path of improvement.

Spiritual and material values, created in the field of physical culture are passed from generation to generation. In this sense, the informational function of physical culture plays an exceptionally important role. It can be said that this function has meaning also for fitness in terms of comparing the achievements and acquired level of physical development and capacity.

The forming of spiritual values through fitness shows that it, as a component of physical culture, is a complex socio-cultural phenomenon. Fitness is not limited only to the physical development of men and women, but it also satisfies a variety of other social needs in the sphere of aesthetic education, of intellectual development, etc.

The specific functions of physical culture are connected, before all, with its properties which allow for the satisfying of natural human needs for physical activity. On this basis is sought optimization of physical condition and development of the organism while taking into account the regularity of health improvement and providing the physical capacity which is required in life. (5)

Fitness, as an important component of physical culture, possesses the same functions. They are realized in the system of university education with systematical development of motor skills and habits, as well as through assimilation of the knowledge connected to them for applying the different types of exercises in a healthy lifestyle.

Fitness realizes its specific function in the system of learning by strengthening the intellectual capacity of students in the process of preparation for different school disciplines. (6)

Its sport functions fitness realizes by stimulating students to achieve maximum results, not only in fitness as a type of sport, but also in other types of sport.

In the organization of free time fitness also plays an important role. Through it students overcome fatigue and have the opportunity to restore the temporarily lost functional capacities of the organism.

Fitness provides the opportunity for students to do physical exercises through which muscular mass and absolute physical endurance are increased, and through there the volume of the muscles (musc. mass) (7)

The physiology of the sport gives account of the peculiarities of the muscles. Skeletal muscles constitute 33%-44% of body mass, and in bodybuilders – up to 50% and more. (8 – 133 p).

The mechanical properties of length, strength and speed of muscle contraction and interaction between muscles are of great importance for sport activities. The speed of muscle contraction decreases gradually when load is increased, which should be taken into account when planning the training process. Another thing that is taken into account is the different types of muscle strength (absolute, specific, relative). For a fitness workout it is important to account also for explosive force – development of maximum strength (contraction) for minimum time.

Important for the practice of the sport is also the so called “rule of average load”, for example finding the optimal range of muscle contractions when doing a particular exercise, because muscles perform the biggest amount of work not when exercising the biggest amount of load, but when under an optimal load. The capacity, or power, on the other hand, depends on the strength and speed of muscle contraction. Individual work in fitness education provides an opportunity to find the right physical load for each student, optimal for strength, range, and speed of movements, which is really important for achieving a high level of efficiency ratio.

Accent on skeletal muscles shows fitness' abilities to improve strength, symmetry and harmony, without the need to participate in competitions. Through regular and correct workouts with a regular increase of load, muscles adapt to bigger and bigger stress and their strength is increased in all of its varieties. The increase of strength is tightly related to changes in muscle mass and building a harmonic physique.

Through fitness a good development and enough volume is achieved, as well as proportionality, symmetry of separate muscle groups and relief of muscles. With the improvement of the quality of the muscles, alongside, the whole motor apparatus is

activated and improves the capacity of all organs and systems in the organism, increases work capacity, maintains positive health.

Motor activity is, before all, a personal activity of the individual in the sphere of physical culture and sport, which includes components foreseeing basic knowledge of methodically competent physical improvement, personal motivation for physical preparation with a higher accent on activity and way of life. In the system of higher education, not much attention is paid to personalization of the process of physical education for complete realization of the potential of the person.

In this case, big perspectives are unveiled for fitness education in regards to the overcoming of the contradiction on socio-pedagogical level between the increasing demands of contemporary society for professional opportunities of future specialists in terms of economy, culture, science and the decreasing of young people's health condition, physical activity and work capacity.

PURPOSE

In order to personalize fitness preparation for students as a basis for individual adaptation to specific conditions and habits of a healthy lifestyle a new technology for fitness education is being created and applied to students of different specialties in SU "St. Kliment Ohridski".

The created new technology is oriented not only towards developing of physical qualities and vital motor skills and habits, but is a system which gives knowledge for maintaining and strengthening one's health and through which a need for a healthy lifestyle and physical improvement is developed. The aims of this education are to fully account of the individual characteristics of a person in the process of physical improvement, the ability to overcome stressful situations and stimulation of the intellectual capabilities of the students (9).

METHODS

The results from the experimental education with this technology, realized during two consecutive academic years (2016-2017 and 2017-2018) show a significant increase in **measurement of physical capacity in the students.**

During the first year of the educational experiment, a new method for fitness

education is applied to 55 beginner students, of which 15 are women. Men are divided into 2 groups of 20 people. During the second year of education, the education continues as a fitness education for advanced students. Some of the experimental elements are improved, some exercises are left out, new ones are added, an overall method for advanced learners is applied. In the meantime a new group of 54 beginner students joins the experiment, with which another verification of the beginner methodology is performed.

Standard methods of testing are applied, the research is carried out by the sport team in the available sport halls, in which the education process took place. The research is based upon the created organization and includes 138 students of different faculties participating in the academic discipline "Physical education and sport".

The students from almost every faculty (12 total) participate in the fitness classes, the most of them being from the Faculty of Jurisdiction the reason for this being that for students of this faculty, sport is a mandatory academic discipline.

The range of the age group, naturally, is 19-25 years. Data shows that students are mostly at the age of 19-22, which is first and second year of education.

The participants in the experiment are almost at the same age, which allows for an objective comparing of the results. What is striking is that the highest percentage of students are 20 years old, and the biggest interest shown towards physical exercises is in the second year of education.

RESULTS AND DISCUSSION

The percentage of male students is higher because the gymnasium is intended for education of men. All the participants from the first year of education continue with the experiment for the two academic years (2016-17 and 2017-18), and more than half of them continue their fitness education the following year (53.7%)

The analysis of the gathered research data is done in three basic directions – anthropometric indicators, measuring of physical capacity, measuring of functional capacity, which are all related to the tasks of the research. Information is given for the average arithmetic value (\bar{X}), average square deviation (S),

coefficient of variation (V%), Scope (R), Asymmetry (As), Excess (EX) of all indicators in the research (Application 3). The credibility of separate statistic parameters of the research and the compared indicators are established using the Student's t-criterion and Wilcoxon's t-criterion.

The analysis is carried out on the basis of the observed indicators for:

- Anthropometrics: height, weight, IBM (index body mass);
- Physical capabilities: squats or 30 seconds, abdominal presses, depth of inclination, push-ups, bench press, squatting with a bar on the shoulders behind the neck, dead lift, pull-ups, dips;
- Functional capabilities – Rufie test, heartbeat at rest, after stress and after restoration.

The data on anthropometric indicators within the age group, which are in the research,

can't be changed significantly and authentically within the experiment. Some of these indicators we accept as basic and therefore we use them as a starting point for acquiring information for the somato-type of the people tested, i.e. they are a part of the constituting experiment. In it are included all the indicator tests both for anthropometric and physical development indicators

The initial data for anthropometric indicators of the constituting experiment show that the sample group is quite heterogeneous both for men and for women. The coefficient of variation (V) is very high at the indicators for physical development, which shows us that the students who begin their education in the University are with very different physical abilities. (**Table 1**). Only at the indicator for body mass index, the values have a normal frequency distribution, that is, they have low scatter value.

Table 1. Variation analysis of incoming data for anthropometrics

Gender		N	Min	Max	R	Xavg	S	V%	As	Ex
Male	Height	94	165	200	35	181,1	7,109	50,5	,496	,624
	Weight	94	57	116	59	77,0	12,695	161,1	,843	1,150
	Body mass index	94	,33	,58	,25	,42	,056	,003	,505	,302
Female	Height	15	153	173	20	164,9	5,630	31,6	-,725	-,057
	Weight	15	42	67	25	54,2	6,847	46,8	,339	-,196
	Body mass index	15	,27	,39	,12	,33	,0338	,001	,300	-,498

From the results shown from the variation analysis, we can see that the distribution of values has quite a big range, which follows from the big difference in the preliminary physical preparation and development of the students.

The data analysis from **the examination of physical capacity** shows that the distribution in the sample group is not normal as the

coefficient of variation is above 30%, except for the data from the examination for abdominal press and squats for 30 seconds. The coefficient of variation there is under 30% and therefore we can use Student's t-criterion for dependent samples, especially for men for both tests and for women only for squats for 30 seconds. (**Tables 2 and 3**)

Table 2. Variation analysis of the input data for physical capacity for the first year of education (men)

Indicator	N	Min	Max	R	Xavg	S	V%	As	Ex
Squats for 30 s	94	18	31	13	24,87	3,080	9,4	-,227	-,749
Abdominal press	94	16	34	18	24,71	4,103	16,8	,677	,087
Depth of inclination	94	27	58	31	44,51	7,672	58,8	-,351	-,606
Push-ups	94	9	70	61	38,38	13,708	187,9	,269	-,036
Bench press	94	30	125	95	76,81	21,224	450,4	,115	-,054
Squats with a bar on the shoulders behind the neck	94	30	150	120	68,56	27,017	729,9	1,056	1,019
Dead lift	94	30	150	120	70,11	31,186	972,5	,645	-,517
Pull-ups	94	1	21	20	9,54	4,753	22,5	,424	-,096
Dips	94	3	50	47	16,71	9,359	87,5	1,256	1,893

Table 3. Variation analysis of the input data for physical capacity for the first year of education (women)

Indicator	N	Min	Max	R	Xavg	S	V%	As	Ex
Squats for 30 s	15	21	30	9	25,33	2,637	6,9	,203	-,146
Abdominal press	15	16	31	15	24,00	5,099	26,0	-,063	-1,18
Depth of inclination	15	27	67	40	46,53	10,218	104,4	,019	,044
Push-ups	15	2	12	10	6,93	2,915	8,4	,076	-,733
Bench press	15	15	40	25	26,33	6,673	44,5	,269	-,201
Squats with a bar on the shoulders behind the neck	15	30	50	20	36,00	7,368	54,2	,841	-,470
Dead lift	15	20	40	20	28,67	6,399	40,9	,339	-,356
Pull-ups	15	0	5	5	2,73	1,438	2,0	-,127	-,355
Dips	15	0	2	2	,33	,617	,3	1,792	2,625

In the women’s group we can observe a low coefficient of variation for the tests “push-ups”, “pull-ups” and “dips”, but this is so because of the low values on these tests, i.e. bad physical condition, especially for the exercises that the girls don’t usually do if they don’t practice any sport activities.

From **Table 4** and **Figure 1** we can observe that the increase of values for men between the first and second year is almost double, and for the women it is triple.

Table 4. Changes in the values for “Squats/30 s” and “abdominal press” at the beginning and at the end of the Second year

Indicator	Beginning		End		increase	t	P(t)
	X _{in}	S _{in}	X _{out}	S _{out}			
Squats/30 s 1 st year, men	22,79	2,145	27,32	2,334	4,53	-30,158	100%
Squats/30 s 2 nd year, men	22,79	2,145	29,92	4,293	7,13	-13,196	100%
Squats/30 s 1 st year, women	22,80	2,210	26,33	2,664	3,53	-9,390	100%
Squats/30 s 2 nd year, women	22,80	2,210	29,92	4,293	7,12	-4,781	100%

The results show that Student’s coefficient (t) is above its critical values and the increase is credible, which means that the fitness education has had a positive influence for the improvement of physical condition for both a period of practice of one academic year and a period of two academic years.

The improvement of the results for every indicator throughout the two years of education for the students who continued their practice during the second year are presented in the following graphics (**Figures 1, 2, 3, 4, 5, 6, 7, 8 and 9**)

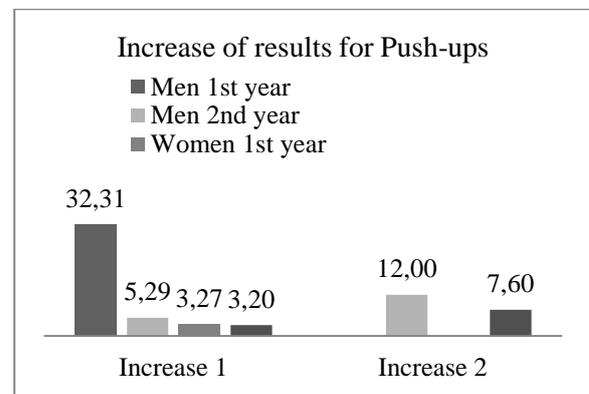


Figure 2. Push-ups

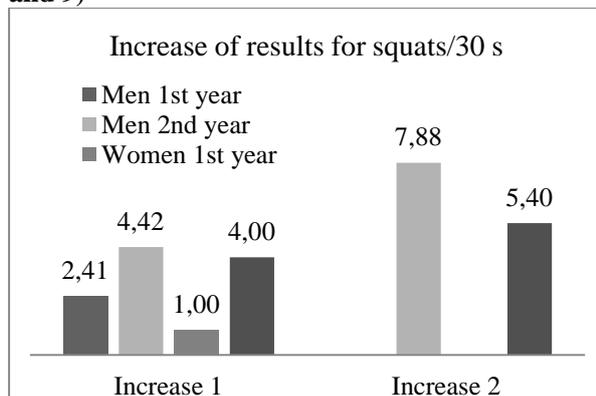


Figure 1. Squats/30 s

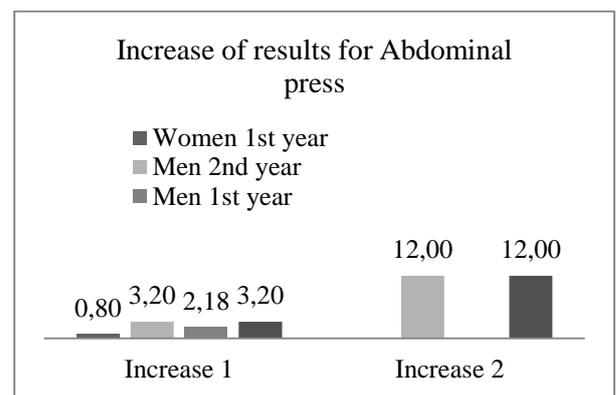


Figure 3. Abdominal press

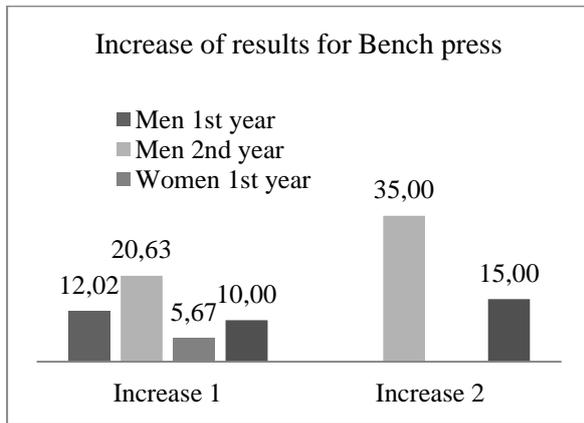


Figure 4. Bench press

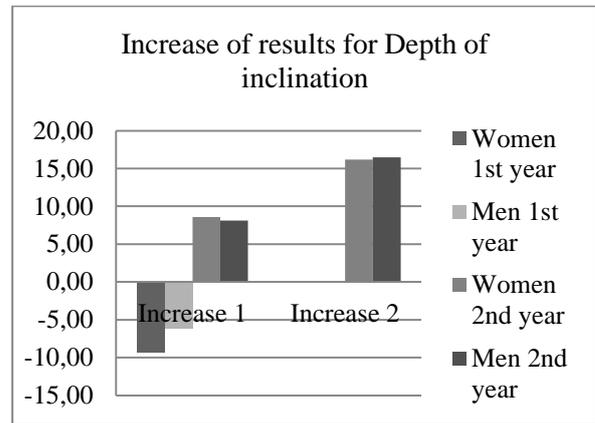


Figure 8. Depth of inclination

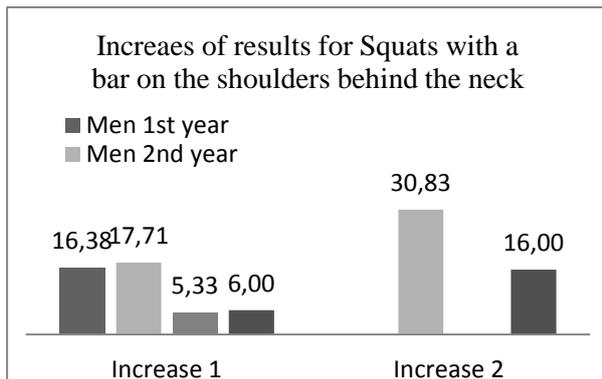


Figure 5. Squats with a bar

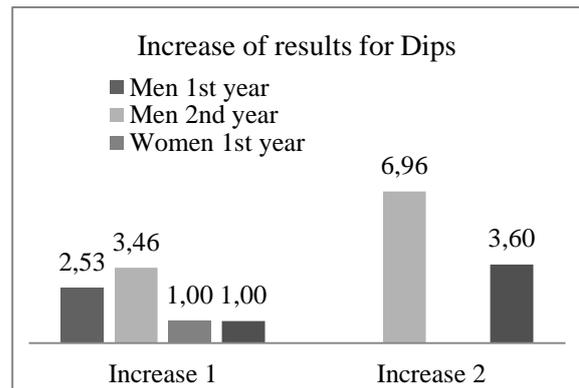


Figure 9. Dips

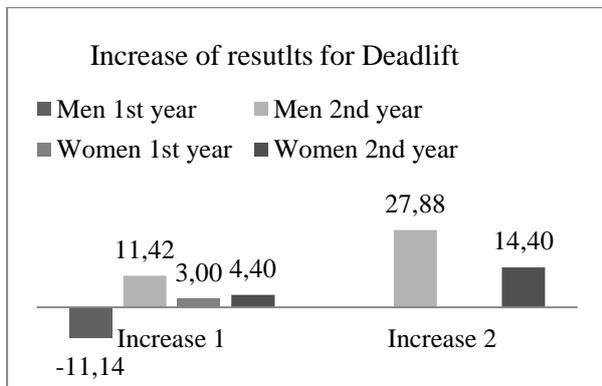


Figure 6. Dead lift

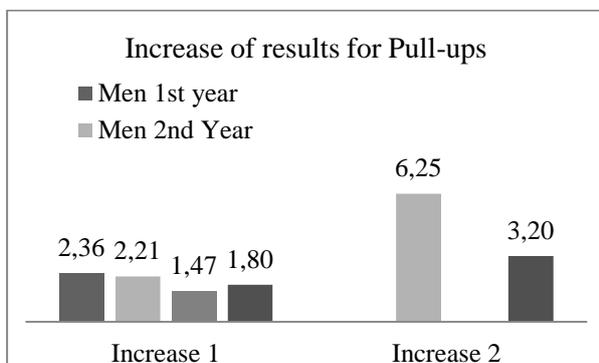


Figure 7. Pull-ups

Data from the comparative analysis of the results from the measurement of functional capacity is presented in the table below (table 5), where we can observe the positive increase (with a negative sign), especially after the second year of education.

The size of the effect – Cohen’s coefficient – is big for the second year of education (over 0.8). The effect for the first year is moderate and significant (upto 0.5 and 0.8)

The warranty probability value (Pt) is higher than 95%, except for Rufie index during the time of stress for the first year of education. As can be seen for the second year of education, the growth value (D) increases by quite a lot (from -1,83 to -4,52), so does the warranty probability value (Pt-100,00) at a level of significance $\alpha > 0,05$ (0,001).

CONCLUSIONS

The statistic processing of input and output tests allows us to check the statistical significance of the results received at the end of the education for the first and second year of education by applying the t-criterion of Wilcoxon.

A conclusion can be made that the method for fitness education in Sofia University "St. Kliment Ohridski" is applicable also in other higher education institutions that do not have

their focus on sport for student's perspectives and development in fitness education without them being professional sport players.

Table 4. Changes in the values for "Squats/30 s" and "abdominal press" at the beginning and at the end of the Second year

Indicator	Beginning		End		increase	t	P(t)
	X _{in}	S _{in}	X _{out}	S _{out}			
Squats/30 s 1 st year, men	22,79	2,145	27,32	2,334	4,53	-30,158	100%
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Squats/30 s 1 st year, women	22,80	2,210	26,33	2,664	3,53	-9,390	100%
Squats/30 s 2 nd year, women	22,80	2,210	29,92	4,293	7,12	-4,781	100%

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