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Four-year dynamics of health indicators among the University students who practice Hatha Yoga regularly

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Purpose: *to determine the dynamics of a four-year university students in health indicators, regular practice hatha-yoga.*

Material & Methods: *the methods of theoretical analysis, synthesis and compilation of information about the study, physiological and educational testing, pedagogical experiment, methods of mathematical statistics. For experimental verification of developed on hatha-yoga program was formed by a group of 30 students enrolled in the first course of a classical university and expressed a desire for a four-year training visit this section three times a week. Age of students before the start of the experiment was 17–18 years old and they did not have special physical training.*

Results: *it was found informative characteristics, which is possible to appreciate the level of health in the student's age. The content of training programs on hatha-yoga for university students who do not have special physical training. Experimentally tested program developed by hatha-yoga with students in universities for four years and recorded the dynamics of their health indicators.*

Conclusions: *quantitative data of the study show the positive impact of regular exercise on hatha-yoga on the body of students. Positive dynamics is set according to the normalization of blood pressure and heart rate, improving posture, reducing excess body weight, improving physical qualities, enhancing the characteristics of the respiratory system.*

Keywords: *student, university, health, training, hatha-yoga.*

Introduction

The health status of nowadays youth is diagnosed at the low level. However, this period is characterized by the highest standard of activity and performance of the young people, and is favorable for the implementation of career ambitions and is the most optimal for the reproduction. The importance of preserving the existing potential at the student age, the formation of the ability to manage the reserves of the body effectively, contribute to the improvement of the life's quality in later years. General increase of the student's motor activity can be presented as the means of the health indicators improvement, the volume of which, in the framework of the university studies in physical education, is insufficient. In recent years it has become possible to increase the general motor activity of the students with the help of different popular health improving physical systems. Hatha yoga is one of them, which is mainly oriented on women. However for the widespread use of the hatha yoga classes among the university students, some special studies about the impact of this ancient eastern health improving system on the young women's health will be required.

Analysis of the recent research and publications

In the literary sources [1; 2] the main accent is made on the continuous monitoring of the students health. The authors [4–6] recommend the use of the modern means of the popular physical activities for students. The positive impact of yoga on cardiovascular [8; 11; 14] and respiratory [3; 12; 13; 15] systems, general improvement of the body's metabolic processes [9; 10] during practicing this wellness system, are widely covered by the different foreign sources. The main features of the conducting the training program in women's groups are given in [5; 7]. This article highlights the material on the health monitoring of the university students practicing hatha yoga regularly during their period of study.

The purpose of the research

To determine the four-year dynamics of health among the university students, who practice hatha yoga regularly.

Objectives of the research:

1. Indicating informative characteristics, which can help to determine the level of health at the students age.

2. Expanding the content of the hatha yoga training programs for the university students without special physical fitness.

3. Experimental testing of the hatha yoga training program, specially developed for the female students, within the four years period, and recording the dynamic of their health condition.

Material and Methods of research

Methods and procedures: methods of theoretical analysis, synthesis, and synthesis of the information relating to the research, pedagogical and psychological testing, method of pedagogical experiment, methods of mathematical statistics.

By means of theoretical analysis, has been revealed that hatha yoga raises the level of health and psycho-emotional stability, strengthen the cardiovascular and nervous systems, and helps to improve body posture. Proceeding from this, the following informative characteristics, which make it possible to determine the level of health at the students age, have been established:

Index of the physical condition according to the methodique of A. E. Pirogova;
Assessment of adaptive capacity of the circulatory system by R. M. Baevsky;
Skibinskaya's index;
Assessment of the somatical health condition by G. L. Apanasenko;
Assessment of the of the spinal column condition by Mashkov;
Assessment of the brachial's index.

Hatha yoga classes are generally more popular among the female due to the fact that during their perfomance static exercises are mainly used. Therefore, for the objectivity of the study the testing group should be formed of the students only.

The content of the hatha yoga exercises program for the university students without special physical fitness, has been illustraded at the source [5]. According to the schedule of the program, the students have been attending hatha yoga classes three times a week with a duration of an hour and a half per each session. The academic year training program was divided into four three-month periods, and the physical load have been gradually increased with the onset of each of the periods. During the weekly training cycle the following hatha yoga exercises have been performed:

standing poses;
sitting, lying, and derived poses;
twisted and abdominal poses;
balancing postures (balance);
poses with different body deflections;
inverted poses.

The perfomance of the following exercises was mainly based on the classical physical activity classes building structure : preparational (Duration 23 minutes), main part (48 min) and final part (19 min) Apart.

For the experimental verification of the special developed hatha yoga program, a group of 30 female students , who expressed their desire to attend these sessions three times a week during a four year period, was formed. At the beginning of the experiment, the age of the students was 17–18, and none of them could fit to the special index of the physical health by E. A. Pirogova.

The changes of the benchmarks have been recorded bat the beginning of the four-year experiment and by the end of each academic year. The average result of the students on each characteristic was compared with the help of the Student's t-test, between the measurements at the end of the school year and for the entire period of the experiment.

Results of the research and their discussion

In the analysis of the average group's (n=30) benchmarks diagnostics of the functional characteristics of the students body indicators during the four-year period of the regular hatha yoga sessions, the positive overall improvement of their health dynamics has been set. As it can be seen from Table – statistical significance at $p<0.05$ and $p<0.01$ between the majority of the benchmarks indicators is reflected.

At the beginning of the four-year experiment, the index of the physical condition, determined by the method of Pirogova, of the students who had just began their first year of study, was at 0.49 units. (below the average), after attending regular hatha yoga sessions, three times per week during the academic year, the same indicator was measured at the level of 0.54 units. (the average level) by the end of the academic year. At the end of the second rate, the index stood at the level of 0.61 units (the average level), during the third year, it has been improved up to 0.69 units (above average), and by the end of the Bachelor the level has reached above the average – 0.78 units.

According to the evaluation of the adaptive capacity of the circulatory system by the method of R. M. Baevsky, adaptational deficiency in the 3,75 un. experimental group has been defined at the begining. By the end of the 1st and the 2d year, the indicators have reflected the tension of the adaptation mechanisms in the students bodies: 3,11units and 2,41 units. By the end of the 3d and 4th year, the students have been considered with the satisfying body's adaptation with the following indicators: 2,09units and 1,79 un.

By the time of enrolling in University, Skibinskaya's index in the students experimental group, was measured at the level of 9.02 un., which reflects unsutisfactory ratings. By the end of the first and the second courses, the indicators have been showing positive evaluation of 15.87 and 25.09 un. By the end of the third and fourth year, students indicators were identified at a good level: 31.98 un. and 38.46 un.

According to the procedure of Apanasenko, the assessment of the students physical health, shows that their rates were at the level of 2.51 points by the time of their enrolling in University, thereby indicating a low level. After practicing hatha yoga regularly during their first year of study, a similar result was equal to 5.71 points (below average). A year later – by the end of the second year, the students score was equal to 8.24 points (average level). By the end of the third year, it has been improved up to 11.28 points (above average). By the end of the Bachelor, the level of the students somatic health has reached its highest rate – 15.63 points.

When assessing the state of the first year students spinal column by Mashkov – the asymmetry of 1.23 cm has been recorded, which indicates the presence of scoliosis. By the end of the first year of the regular hatha yoga practices, the situation has been improved to the average of 0.72 cm. After two years of the regular hatha yoga sessions (by the end

Four-year dynamics of health indicators among the students (n=30), who practice Hatha Yoga regularly

Control diagnostics	Measurement Units	Initial indicators		$\bar{X}_0 \leftrightarrow \bar{X}_1$	I academic year		$\bar{X}_1 \leftrightarrow \bar{X}_2$	II academic year		$\bar{X}_2 \leftrightarrow \bar{X}_3$	III academic year		$\bar{X}_3 \leftrightarrow \bar{X}_4$	IV academic year		$\bar{X}_0 \leftrightarrow \bar{X}_4$
		$\bar{X}_0$	m	p	$\bar{X}_1$	m	p	$\bar{X}_2$	m	p	$\bar{X}_3$	m	p	$\bar{X}_4$	m	p
I	у. е.	0,49	0,01	<0,05	0,54	0,01	<0,01	0,61	0,01	<0,01	0,69	0,01	<0,01	0,78	0,01	<0,01
II	у. е.	3,75	0,04	<0,01	3,11	0,04	<0,01	2,41	0,03	<0,01	2,09	0,02	<0,01	1,79	0,02	<0,01
III	у. е.	9,02	1,07	<0,01	15,87	1,24	<0,01	25,09	1,39	<0,01	31,98	0,87	<0,01	38,46	1,13	<0,01
IV	баллы	2,51	0,87	<0,05	5,71	0,69	<0,05	8,24	0,51	<0,05	11,28	0,96	<0,05	15,63	1,07	<0,01
V	см	1,23	0,06	<0,01	0,72	0,05	<0,01	0,48	0,04	<0,01	0,19	0,02	<0,05	0,11	0,01	<0,01
VI	%	75,13	1,99	>0,05	79,14	1,81	>0,05	82,99	1,68	<0,05	89,18	1,21	<0,05	94,82	1,42	<0,01

Note. *I – index of the physical condition by E. A. Pirogova; II – assessment of the adaptive capacity of the circulatory system by R. M. Baevsky; III – Skibinskaya's index; IV – assessment of the somatical health condition by G. L. Apanasenko; V – assessment of the spinal column condition by Mashkov; VI – assessment of the brachial's index. The boundary value of the Student's t-test for p<0,01 is 2,75, for p<0,05 – 2,04.*

of the 2nd year) the simular students indicator represents 0.48 cm, which appears to be normal asymmetry. By the end of the third and fourth year, the students have represented an excellent posture with the asymetry indicators of 0.19 cm and 0.11 cm.

At the beginning of the four-year experiment, the shoulder rate of the students was showing the presence of stoop – 75.13%. However, a slight improvement (at $p<0.05$) has been recorded by the end of the first academic year – up to 79.14%. After two years of hatha yoga regular practices, the mark has reached its norm – 82.99%. By the end of the third and fourth year, the simullar indicators have reached a level of 89,18% and 94,82%, which considered to be a good posture.

Quantitative survey data reflect the positive impact of the regular hatha yoga exercises on the students body. Four-year dynamic of the students health has been determined on the basis of normalization of the blood pressure and heart rate, posture improvement, reducing of the body weight, improvement of the physical qualities, improvement of the characteristics of the respiratory system.

Conclusions

1. The following informative characteristics, which can help to determine the level of health at the student age, have been set: index of the physical condition by E. A. Pirogova; assessment of adaptive capacity of the circulatory system by, R. M. Baevsky; Skibinsky index; assessment of the physical health, by G. L. Apanasenko; assessment of the state of the spinal column by Mashkov; assessment of the brachial index.

2. The content of the hatha yoga training programs for the university students without special physical physical fitness, has been expanded. According to the training sessions weekly programe, the following hatha yoga exercises have been used: poses performed in a standing position;

Standing poses
Sitting poses, lying, and derived poses;
twisted and abdominal poses;
balancing postures (balance);
poses with body deflections;
inverted poses.

3.During the four years of experimental testing of the hatha yoga training program with the university students, positive dynamics of their health indicators with statistical significance $p<0.01$, have been recorded.

Prospects of the research. Justification of the benchmarks of the level of mastering hatha yoga exercises by students, in accordance with the European Credit Transfer System.

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