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Research paper

Medical Engineering Application in Health Life-Style of Students

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Abstract

The ancient Greek philosopher Plato called movement as "salutary part of medicine", while writer and historian Plutarch – as "storehouse of life". Do we always apply efforts in order this "storehouse" be full? Today in the age of scientific-technological progress large-scale utilization of manual labour has been practically disappeared and there has been opened the door for the so called "diseases of the century". The analysis of the results of students' health and healthy life-style problems study has been presented in the article. The role of physical culture and of the department of physical culture in this process has been determined. The ways of university's educational environments resources stirring up for this problem solution have been outlined. Many people try to fully protect themselves against physical activity. They think that the less physical activity the healthier they become. Many students try to make their physical activity less thereby breaking their health. In any ways they try to obtain health certificates in order not to attend physical culture lessons and practically in all cases they get moral support of parents and what is the worst of doctors.

Keywords: *students, health, sociological study, healthy life-style, physical culture, sport; university, physical activity.*

1. Introduction

It is known that continuous mental stress and overwork without physical relaxation provoke hard functional disorders, degradation and approach of premature old age. Many scientists [1-14] determined that regular physical exercises reduce cholesterol amount in blood which promotes the development of atherosclerosis. Simultaneously activation of anti coagulation system preventing thrombus appearance in blood vessels occurs. At the expense of moderate increase of total number of potassium ions and decrease of sodium ions in blood myocardium contractile function is normalized. Adrenal glands release "hormone of good mood" in blood. Taking this fact into consideration it is no wonder that, for example, in Switzerland in small towns situated in mountains where citizens can only move and run there registered no cases of cardiovascular diseases. Such long uniform physical activity as run strengthen immune system at the expense of activation, renovation and increasing of white corpuscles' composition, stimulate blood formation increasing hemoglobin in blood. Medical observations showed that regular run activity can influence the renovation of digestive cells, inhibit the process of muscular tissue substitution by adipose one and normalization of cholesterol amount in blood protect both atherosclerosis development and canceration. New-York insurance company observed 100 thousand clients and discovered that mortality from "the diseases of civilization" of physical active people is three times less than of the rest part of population. Physical exercises are the important means of carbohydrate metabolism disturbance protection. For example, doctors of one of the Swedish towns were able to help 100 prediabetic people out of risk zone by means of sport training only. It is obvious that the possibility of physiological reserves mobilization during intensive physical activity is great. It has been determined that volume of breath per minute grows 20-30 times in comparison with the state of rest, frequency of pulse rises from 50-60 to 240 blows per minute, and arterial pressure – from 120/80 to 200/40 mm of column of mercury. Under the influence of physical exercises blood supply of muscular tissue (including cardiac muscle) becomes better. During physical activity it could open 2500 capillaries on 1 mm of muscle cross section against 30-80 ones in the state of rest. The greatest increase of capillaries amount occurs in the cortex of frontal lobe. Simultaneously the increase of capillaries' length and density of capillary network was registered. The urgency of the given research is becoming greater from year to year as it has tremendous importance in the development of world science and in improvement of peoples' health.

2. Methods

Experimental program of physical culture and technology of its realization was developed on the base of carried out research. The goal of experimental program is the strengthening of educational function and rebuilding of organizational forms of physical training both at lessons and during students' independent activity. Experimental work was organized with the aim to achieve this goal. The control group (45 persons) included the first year students trained according to the traditional form of education. Control group consisted of 45 students who were trained according to the experimental program. The experiment was conducted during the academic year. At the end of the year there were made control tests (sections).

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3. Results

3.1 The Goal of Study

Familiarization of students with regular studies of physical culture and sport, motion activity, improvement of functional ability of organism by means of introduction innovative pedagogic system aimed at individual development in students' educational process. In the process of educational work and functioning of pedagogical system at university the solution of the following problems is carried out: improvement of students' physical development, achievement of high training level, functional state and training organism; teaching of moral, esthetic, motion culture, of aspiration for health, beauty, love and harmony; development of need for self-realization, self-development of individual, breeding of self-respect and sense of respect to other people, formation of readiness to self-development, self-developing activity, objective self-appraisal; moral development, correction of value scale; mentality, formation of visions and ideas. It is obvious that oxygen feeding of brain cells promotes improvement both of physical and mental efficiency. In other words physical culture substantially assists mental activity. It coincides with Aristotle's affirmation about the fact that thoughts flow quicker when the body is warmed up by the walk. As it is known he conducted lessons while walking with his pupils. And on the contrary, the lack of muscular movements makes our muscles weak and our brain open to cerebral affection.
In our age of atom and cybernetics intellectual work more and more displaces physical one or become closely intertwined with it. Many foreign scientists [1] believe that special "mental gymnastics" helps to support high intellectual efficiency. As Horace said, if you don't run being healthy you will run being ill. Practically healthy man should run minimum 15-20 minutes a day covering the distance of about 3-4 km. Old age is not an obstacle for running. For example, Joe Dickens, ever known athlete who was named by journalists as "grandpa of running" run about 7 km every Sunday when he was 90 years old. Sport longevity of Larry Lewes, the American man is more surprising. When he was 102 years old he run 10 km every morning. The distance of 91 m was covered by him during 17,3 sec. (0,5 sec faster than the year before). Philippid, the best runner of ancient Greece who covered the distance of 42 km and 195 m in order to inform about the victory of the Greeks over the Persians in 490 BC is often mentioned in literature. According to other sources of information he covered the distance about 200 km. If it we take into consideration that after this running he took part in the battle we can only be surprised by his stamina. Despite the usefulness of running it should be done under control according to the recommendations developed by specialists. Otherwise the result could be quite sad. For example, James Fix, the initiator of mass passion for running in the USA, died suddenly at the age of 52 during the regular jogging. In the opinion of doctors the cause of his death became the inherited propensity for myocardial infarction, the presence of such risk factors as often smoking and excess weight. Moreover, he went jogging for 30 minutes 3-4 times a week.
We know more facts of death because of myocardial infarction caused by running overdose. This sad statistics include Alexandro Beverini who was 45 years old and the head of department of therapy in Kirov Medical institute professor V.S.Nesterov who was 75 years old. But at the same time there is an example of Larry Lewes, an American waiter from San-Francisco who died at the age of 106 and a day before his death he covered a distance of 10 km. According to pathologists his heart and blood vessels were excellent. So, movement is the essence of life. Movement is the base of health. O.K. Antonov, the well-known aircraft designer, wrote that real physical culture is the reasonable attitude to the organism – receptacle of our intelligence – all 24 hours. We emphasize: not morning exercises, even not sport lessons several times a week but constant round-the-clock culture of attitude to oneself, optimal physical life-style make human existence of full-value.

3.2 Statement of the Problem

Qualitative professional training of students at university is impossible without their energetic educational and labour activity. Economic and social reasons which do not allow making the period of education longer enforce to intensify it. This process requires students' will mobilization, their psychophysical, moral and physical power. However, today it is impossible to put question about restriction of increasing tension in the process of education. So, if it is impossible to free students from psycho emotional and physical tension (and it is probably worth seeking to this), then it is necessary to increase resistance of adaptive body mechanisms to emotional stresses and to streamline their educational activity. It is necessary to teach students healthy life-style for which unity and reasonability of self-organization and self-discipline, self-regulation and self-development processes are typical. These processes are oriented to full-fledge realization of one's own essential forces, gifts and abilities.

3.3 Analysis of HLS Study

Recently there has been appeared special attention to the students' HLS. This fact tells about government and society concern of the university graduates' health, of the incidence rate in the process of professional training, of labour activity reduction. So, it is necessary to consider health and HLS as one of the important educational value os society and student's personality [14].

3.4 Students' Health and University Educational Environment

Studying at university is a complicated and quite long process having the number of characteristic features and making high demands for psyche and physiological functions flexibility of young people. After admission to university there happens the break of yesterday's schoolchildren vital stereotypes. The initial period of training plays sufficient role in the development of adaptive and compensatory mechanisms. Student's health and ailment depends to a great extent on this period. On the base of neurologic status and cardiovascular system study of 2142 first year students there were selected 4 groups: practically healthy students – 1509 persons (70%), students with raised blood pressure - 254 persons (11%), students with phenomenon of hypotension - 90 persons (4%), students with functional neural disorder - 289 persons (13%). In total the second, third and fourth groups involved 29% of the first year students having problems in the level of health. Analysis of patients' files showed that most students taking the academic holidays (83%) began to ill during the first or second years of studies. The reasons of their illness appeared to overpressure and overload in the process of training [1]. Diagnostics of students' level of health carried out at university showed that only 7% of tested students had good locomotive system, 28% of students had functional disorders and 64% of students were in pre- and pathological state. Only 7% of tested students had normal digestive system, 85% of students had functional disorders and 6% of students were in pre- or pathological state. In whole this study showed the presence of subjective complaints and objectively approved pathologies in one or several systems and organs of the most number of tested students. None of the tested students could receive conclusion "absolutely healthy" and only 15% of them could be characterized as "symbolically healthy" (i.e. they had only functional disorders). Study of psyche component of students' health showed considerable cases of asthenia depression and a great number of functional neuropsychic disorders. Only 21% of 312 students of natural sciences and humanities presented stable mentality. Even in the 1980s there were marked the growth of students' nervous system functional disorders – the so called in-

between mental state. Disorders of students' nervous system increase from the first to the third year of studies, and boys in technical universities are in poor health more often. Nervous-psyche disorders develop against the background of social nonadaptive syndrome, mental overloading in the period of passing examinations, on the base of inter-personal conflicts [1].

Analysis of literature [5, 6] showed that in hierarchy of values students consider health to be in the leading positions. Thus, according to different sources of information (average indicators were taken) health as universal value was highly assessed by 75% (±5,0) of boys and girls (girls' assessment was higher). Meanwhile health is correlated with the other universal values: happy family life, comprehensive and balanced development, mental ability, etc. At the same time it is mentioned that the value of health as the means of other goals achievement (achievement of material welfare, career, etc.) appears to be more important for students than the value of health as the means of long and valuable life.

4. Discussion

According to our results (there were tested 380 students of different years of study) the main bulk of young people do not seriously relate to their health. Thus, there were given the following answers to the question if the students watch over their health: regularly watch - 13% of boys, 23% of girls; watch from time to time - 37% of boys, 39% of girls; begin to watch only in case if feel unwell - 50% of boys, 38% of girls. Students do not know their pulse rate in the rest, their blood pressure. Other researchers mark similar students' relation to their health [1-2]. As it was mentioned above, most students think that their health is the necessary condition for the life of good quality, but only small part of them considerably attend their health. This fact leads to the appearance of one more contradiction between verbal awareness of health value and energetic voluntary activity concerning its keeping and strengthening. For example, E.A.Zhitnitskaya et.al mentioned that many students with chronic pathology of respiratory apparatus smoke and are not going to come off with cigarettes. Those who have chronic illness of gastrointestinal tract break the diet and those who suffer from locomotor apparatus disease neglect exercise therapy [1].

The necessary and main precondition for health maintenance is the healthy life-style as the standard model, system of common conditions, arrangements promoting health strengthening and keeping. Numerous researches made possible to conclude in theory and in practice that life-style influence human health for 50%, environment influence it for 25%, heredity effect health for 15% and medicine – only for 10%. Students highly assess healthy life-style but their real behavior contradicts expressed opinion and judgment of HLS value. There were received the following answers for the question if the students lead a healthy life: in general yes - 24%, rather yes than no -18%, rather no than yes -38%, found difficulty in replying -18%. Analysis of the results show that more than 50% of students do not lead the main elements of life activity regime, they have no formed purpose of rational time planning. They violate the norms of mental activity, of everyday life, of meals, of staying in fresh air and doing physical exercises. It is known that modern system of education demands for considerable students' mental activity, but the results of testing show that only 42% of students learn systematically and independently while all the rest study from time to time. Physiologists determined that the best time for beginning independent preparation for studies is the afternoon, 16 p.m. During our study we revealed that 35% of students fulfill their tasks in definite time, all the rest do this work in any time of a day. Considerable part of tested students - 55% - begin to learn the material from 20 to 22 p.m. and some of students start to do their work even later which leads to the poor preparation.

In order to support mental activity on high level and to maintain

In the opinion of many scientists theory and practice of public health will inevitably follow the concept of attack, the concept of physically cultural life-style. According to the forecasts of medical science representatives the most important element of this will be goal-oriented growth of human organism's systems and functions efficiency by means of physical culture [3, 4, 6]. Physical culture unites many components: culture of motion activity, conditioning to the cold, breathing, mills, massage, meditation, utilization of natural factors. Just in this respect it is necessary to speak about physical culture. Then it is obvious that physical culture is the basis and driving force of healthy life-style formation. It is necessary to mention that realizing of physical culture role as one of the leading factors of students' HLS formation serves the tendency of insistent search for efficient pedagogical activity, approaches, and technologies of students' HLS formation by means of physical culture. Monographs, teaching aids, methodological materials are published; doctors' and candidates' theses are defended. All these materials contain theoretical and practical prerequisites of successful solution of the given problem [7, 12, 13].

In the papers devoted to the different aspects of this problem it is specially mentioned that the attempts to revive at universities physical-cultural, health-improving and sport-mass work by means of the old organizational forms and methods do not give necessary results as a rule. Professionals state that unfortunately physical culture studies at universities are aimed at the problems connected with indicators of physical training, credit standards of educational program. But developing this innovative direction of students HLS formation by means of physical culture it is necessary to realize the resources of university's educational environment: administrative resource (development of corresponding university programs, planning of health supporting arrangements, HLS propaganda, support, financing, control, etc.); resources of educational process (introduction of special HLS course, interdisciplinary relations, organization of physical cultural an health-improving arrangements, cultural-mass and free-time work); utilization of regulated (forms of studies) and non-regulated (different forms of independent work) educational environment potential; the resource of public organizations (trade union, sports club, youth associations, etc.); medical service (regular medical inspection, diagnostics of their level of health, preventive measures, medical support, etc.). This year at our university there have been formed 68 groups of health for additional studies. Moreover, two times a week students attend physical culture lessons if they wish, they can choose any kind of sport or be trained according to the chosen system of exercises. These studies are conducted under control of teachers and medical staff. We do not only speak about HLS, we provide it in practice.

6. Conclusion

Results of the research showed that modern students aspire to support their health. Most tested students consider healthy life-style as regular mills, good sleep, going in for sports and denial of unhealthy habits. However, young people do not always follow these simple rules. It is necessary to activate the work of physical culture departments in this direction and to carry out scientific research of this problem.

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