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Health-Improving Model of Physical Education of the First-Year Students with Non-Sport Specialties with the Use of Nordic Walking

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According to modern views, the educational process, on the one hand, correlates with its socially significant content, on the other hand it is stipulated by the student's experience as a subject of the educational process and native bearer of own culture. In recent years, people are increasingly talking about physical education not only as a social phenomenon, but also as a stable personal quality. Therefore, education at the university is focused on the formation of the student as a subject of own physical education. Physical education, being one of the faces of the general human culture, in many respects determines the behavior of the individual in school, at work, at home, during communication, and also contributes to the solution of social and economic, educational and health problems (Baronenko, 2009; Barchukov, 2007; Buslakov, 2004).

Modern scientific literature is full of data showing the significant role of physical education in the improvement of human health and the development of healthy lifestyle. However, there are almost no data describing the actual implementation of the curriculum of physical education at the university and its real contribution to the dynamics of the level of physical development and health of students, in the formation of motivational and value aspect of personal student's physical education at the various stages of training. The dynamics of the formation of students' physical education during the process of their development of this type of culture through the discipline "Physical education" is still not revealed (Egorychev, 2006).

Students' attitude toward physical education and sport is one of the most urgent social and educational problems. Physical education plays a significant role in the professional activity of the bachelor student and specialist, because their work is usually connected with a significant strain of attention, vision, intense intellectual activity and low mobility (Gendin, 2004).

Self-cognition is the necessary prerequisite for the specialist activity in contemporary influences of the environment. Formation of the physical education of the future specialist is impossible without the ability to rationally correct own state by means of physical training and motor activity. Theoretical and methodological and practical sections of the curriculum of the discipline "Physical education" are the most difficult for implementation in the educational process, so it is extremely important to obtain the data that is not currently presented about how the actual study of the discipline "Physical education" influences on the actual formation of the personal students' physical education in order to identify ways to improve the educational process as a whole (Ilyinich, 2005; Kobyakov, 2004).

Keywords: physical education, Nordic walking, health-improving model, physical training, motor activity, questionnaire, physical exercise, personality, activity.

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Introduction

The purpose of students' physical education is to develop the personal physical culture. In order to achieve this goal it is provided for the following educational, training, developmental and health-improving objectives.

Physical education plays a significant role in the professional activity of the bachelor student and specialist, because their work is usually connected with a significant strain of attention, vision, intense intellectual activity and low mobility Physical education reduces tiredness of the nervous system and entire body, increases efficiency, promotes strengthening of health. As a rule, bachelor's and specialist's hours of physical education are held in the form of active recreation.

Movements play a significant role in the interaction of person with the environment (Antonova, 2003; Buslavskaya, 2007; Zhilkin, 2003; Kobyakov, 2004; Popov, 2008; etc.). Doing different and complex movements, people may carry out labor activity while communicating with other people, going in for sports, etc. At the same time organism gets the higher ability to maintain the constancy of the internal environment during the change of external actions: temperature, humidity, pressure, power of influence of the solar and cosmic radiation.

Under the influence of physical training there is non-specific adaptation of the human body to the various demonstrations of environmental factors (Bogatyrev, 2007; Kudryavtsev, 2004).

Experimental data emphasize the stimulatory influence of the optimally organized physical activity on the level of mental efficiency of students (Efimova, 2003; Nikiforov, 2002).

Thus, motor function is the main function of human body that should be constantly improved in order to increase efficiency in any kind of activity, including mental one. It should be noted that, as part of physical education, training and development of motor abilities contribute to the solution of social determined problems: all-round and harmonious development of personality, achievement of the high body resistance to social and environmental conditions, growth of the adaptive organism properties. Training of physical qualities contributes to the development of physical and mental efficiency, more complete implementation of human creative abilities in the public interests.

Formation of students' physical education during the educational process in the tertiary institution is showed in their attitude to the values of physical education and level of development of their own physical education. Students who participated in the study, according to the survey (Egorychev, 2006; Practical work on.., 2000; Semenov, 2007) and depending on their attitude towards physical education and level of training and sports activity can be conditionally divided into four typological groups on the basis of time spent on physical education.

- 1. Students who do not show training and sport activity and spend for the physical education no more than 1 hour per week (14.4 % of respondents).
- 2. Students with low physical training and sport activity who spend for the physical education less than 6 hours per week (60.4 % of respondents).
- 3. Students with optimal training and sport activity, who spend for the physical education 6-7 hours per week (16.3 % of respondents).
- 4. Students with a relatively high training and sport activity, who spend for the physical education more than 8 hours per week (8.9 % of respondents).

Nordic walking is a new and highly effective form of fitness. It was invented in 1970s by finnish athletes, that is why it is called «Nordic». In order to train the whole year round,

they needed a way to imitate the cross-country skiing when the snow had been already melted. It was originally used by professional athletes for practicing the technique of skiing during the summer, but now it has become the popular form of recreation.

Results of research (Cooper Institute Dallas, Texas) confirmed the hypothesis that Nordic walking is a safe form of recreation that is appropriate for everyone who wants to preserve and improve an aerobic endurance of the body and strengthen muscles of entire body (shoulders, arms, back, abdomen, legs). Nordic walking is effective for the rehabilitation of people suffering from heart disease, it makes it easier to climb, unloads knees, hips and waist up to 26 %, and it is also helpful for people with degenerative diseases of joints and back, and for overweight people. The key elements of safe physical activity are the poles and correct technique of walking.

Mechanism of action

- 1. When walking or jogging upper body muscles work insufficiently. While walking ski poles allow exercising the entire body, not only the muscles of the legs. Usage of ski poles, along with walking at a fast pace makes it possible to use up to 90 % of the muscles of our body.
- 2. It is a good aerobic exercise that increases energy expenditure by 20-40 % compared with normal walking. Nordic walking increases the maximum oxygen consumption by 20-2 %, but it is by 45 %more efficient than normal walking.
- 3. Due to the use of poles, the pulse rate is increased, on the average of 10-15 % compared with normal walking. There is burning of about 450 calories per hour that is much more than during the walking without poles.
- 4. Nordic walking reduces tension of neck and shoulders with osteochondrosis, provides the good load on the muscles of the body and neck and shoulder apparatus.

- 5. It reduces the load on feet, joints and knees are not overload that is especially important for people suffering from joint diseases and rheumatism.
- 6. Ski poles also improve stability during the fast motion.
- 7. There is training of endurance, strength, mobility, coordination, but not speed.
- 8. During the stops on the way poles are used for stretching exercises and breathing exercises.

Motor activity of the student and usage of Nordic walking during the lessons have a significant impact on the development and state of the cardiovascular and respiratory systems. When person works with a heavy load during the sports exercises, the heart will be inevitably trained, the limits of its possibilities will be expanded, it adapts to the pumping of the amount of blood that is much greater than it can be done by the heart of the untrained man. During the regular use of Nordic walking during the lessons, as a rule, there is an increase of the mass of the cardiac muscle and heart size. Energy costs of physical work are provided with the biochemical processes occurring in the muscles as a result of oxidative reactions that constantly need oxygen. During the muscle work in order to increase the interchange of gases respiratory function and blood circulation are becoming faster.

During the regular use of Nordic walking, the number of erythrocytes and hemoglobin in the blood increases, providing growth of the oxygen capacity of blood. The number of leukocytes and their activity also increases that improves the body's resistance to colds and infections.

We conducted the pedagogical research and experimental work consisting of five stages since January, 2005 to May, 2008 in Krasnoyarsk city. We held the discussions with lecturers in tertiary institutions, the first-year students, questioned

people in order to obtain more precise and comprehensive picture of their understanding of healthy lifestyle, conducted pedagogical observation of the organization and conducted lessons of physical education.

During the process of research, it was determined how people under study understand the healthy lifestyle and how they assess their health (the level of mental and physical development). We also determined their sphere of interests, types of activities that are actually done by them and that are would like to be done by them, their participation in sports and physical activities, a list of tools that are used by them in order to maintain (or improve) their physical state. All these facts were attached to the definition of basic physiological indicators of physical fitness. We also showed the significant impact of Nordic walking on the main body systems and organs of the students.

The results of the understanding of healthy lifestyles were recorded in the special student questionnaires that were displayed in the appropriate tables. Students under study were the first-year girls and young people (17-19 years) from Siberian Federal University who study non-sports major subjects: Department of Radio Engineering (RE), Department of Computer Science and Control Processes (DCSCP), Department of Engineering Physics (DEF), Department of Computer Engineering (CE), Department of Mechanical Technology (MT) and Institute of Business Management and Technology (IBMT). In total 85 people participated in our questionnaire (57 young people and 28 girls). People under study almost did not have any sports grades. Then students were divided into control and experimental groups. We conducted a preliminary experiment for both groups on the basis of instrumental techniques:

• Pulp pulsometry (assessment of heart rate)

- Spirometry (assessment of vital capacity of lungs)
- Respiratory rate (assessment of respiratory rate)
- Maximum oxygen consumption (assessment of maximum oxygen consumption)

We analyzed and processed the received data, and on that basis we developed the health-improving model of the first-year students' physical education courses with non-sports major subject. The model consisted of the set of exercises with the usage of Nordic walking, methods of individual monitoring and correction of physical fitness and condition of the indicators of physical fitness of the first-year students with non-sports major subject during the lessons of physical education.

The control group continued to train according to the program of physical education of the first-year students, and experimental group had lessons according to our model that took into account the level of student's proficiency in physical activity, level of skills in the cross-country skiing. It was a set of specially chosen exercises with the usage of Nordic walking that were performed with different levels of complicacy during a certain period of time or a certain number of series for the improvement of the students' physical fitness, enhancement of health, increase of efficiency.

After the implementation of the healthimproving model, we again conducted questionnaire among students after their finishing of the second academic year on some issues relating to training and sports activities.

As it can be seen during the second academic year, all people under study who were trained (including physical education) at the university have improved their percentage rates of participation in training and sports activities, they have also changed the types of leisure

activities and have started to show more serious attitude to the physical education and sport.

Conclusion

Our research of the level of students' health and their understanding of the healthy lifestyle makes it possible to come to the following conclusions:

- 1. We analyzed the current state of physical education in tertiary institution; as a result we found out that main features that characterize the physical development of the person are strength, speed, agility, flexibility and endurance. Improvement of all these qualities contributes to the improvement of health. Under the influence of physical training there is non-specific adaptation of the human body to the various manifestations of environmental factors.
- 2. We conducted the study of the level of health of the first-year students with non-sports major subject and their understanding of a healthy lifestyle.

It was revealed that healthy way of life is mostly characterized by «the conscious and responsible attitude to your health» (79 % of respondents). Less than a third of respondents (28 %) consider their health as good, slightly less than half of respondents (47 %) consider it as satisfactory and part of respondents (17 %) consider it as bad (weak). Physical education and sport were assessed with the highest mark by 66 % of respondents, 68 % of respondents also highly valued «regular physical activity» as a characteristic of a healthy lifestyle. Share of chronically ill was 59 %. If they could include some students who found it difficult to answer (7 %), it is more than half of the respondents.

Less than half of respondents consider themselves as physically developed people (45 %). It was found that less than half of respondents (43 %) are doing their morning exercises that are the basis of physical education, while other part of people are not involved at all (57 %).

Questionnaire revealed that a fifth of our students (19 %) are not interested in sport at all. Others are TV «fans» – 57 %. A quarter of respondents (25 %) are "actively involved in sport». Among the tools that are used to maintain the physical state, the first place was taken by «physical exercises» (62 %), the second place was taken by «steam room, sauna» (38 %). The third place goes to «massage» (31 %).

The most common type of activity in spare time among students is "entertainment" – 77 %, the second and third places with the results of 67 % and 49 % are shared by such diverse activities as "communication with friends" and "watching television". The most healthy form of recreation – "sport, tourism, travelling" – is included in the five types that are commonly practiced by almost half of respondents (46 %).

However, the most popular types of leisure activities – «communication with friends,» «watching television», «extra earnings» – as the survey showed, are not the most desirable for the students.

- 3. Implementation of the health-improving model in the academic process of the first-year students that is taking into account the level of the body development during adolescence, individual abilities and interests, provided reliable growth of indicators of a number of physiological parameters in the state of relative rest:
 - improvement of the heart rate, that is, the change in the experimental group was 12,6 % (p <0,05), in the control group 4.6 %.
 - change of the vital capacity of lungs in the experimental group by 8,1 % (p <0,001), in the control group by 3.2 %.
 - change of respiratory rate in the experimental group by 22,2 % (p <0,05), in the control group by 5.9 %.

- change of the maximum oxygen consumption in the experimental group by 16,8 % (p <0,05), in the control group – by 8.7 %.

Comparative analysis of rates in the experimental and control groups showed the higher increase in the experimental group of students at the reliable level of significance.

4. On the basis of this study we revealed the high practical efficiency and social importance of g the developed health-improving model of physical education of the first-year students with non-sports major subjects. The results can be widely used in the industry, in programs of physical education of students, as well as in lecture courses for students wit non-sports major subjects.

Practical recommendations

This study of the efficiency of the healthimproving model of physical education of the first-year students with non-sports major subjects with the usage of Nordic walking allows to recommend coaches and teachers who are working with students to do the following:

1. Nordic walking should be regarded as a good aerobic exercise that increases energy expenditure by 20-40 % compared with normal walking. Nordic walking increases the maximum oxygen consumption by 20-25 % that is by 45 % more efficient than normal walking.

Due to the use of poles, the pulse rate is increased, on the average of 10-15% compared with normal walking. Nordic walking reduces tension

of neck and shoulders with osteochondrosis, provides the good load on the muscles of the body and neck and shoulder apparatus.

It reduces the load on feet, joints and knees are not overload that is especially important for people suffering from joint diseases and rheumatism. It improves physiological parameters such as heart rate, maximum oxygen consumption, vital capacity of lungs, respiratory rate, that is, it serves as a health-improving tool.

- 2. The main content of the work on the formation of the health-improving model of physical education of the first-year students with non-sports major subjects should be carried out in the following areas:
 - systematic analysis of the student's activity during the lessons of physical education;
 - development of the students' focus on the activity effectiveness as the personal quality;
 - formation of the students' fundamentals of healthy lifestyle, taking into account peculiarities of their specialty and individual characteristics;
 - improving of the students' level of the basic physiological indicators of physical fitness, such as heart rate, vital capacity of lungs, respiratory rate, maximum oxygen consumption;
 - ensuring of the positive emotional background during the lessons of physical education.

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Оздоровительная модель физического воспитания студентов 1 курсов нефизкультурных специальностей с использованием нордической ходьбы

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Согласно современным представлениям образовательный процесс, с одной стороны, соотносится со своим социально значимым содержанием, с другой — обусловлен опытом студента как субъекта образовательного процесса и носителя собственной культуры. В последние годы все чаще говорят о физической культуре не только как о социальном феномене, но и как об устойчивом качестве личности. Поэтому образование в вузе ориентировано на формирование студента как субъекта собственной физической культуры. Физическая культура, будучи одной из граней общей культуры человека, во многом определяет поведение личности в учебе, на производстве, в быту, общении, способствует решению социально — экономических, воспитательных и оздоровительных задач (Бароненко, 2009; Барчуков, 2007; Буслаков и др., 2004). Современная научная литература полна данными, показывающими значимую роль физической культуры в оздоровлении организма человека и в становлении здорового образа жизни. Вместе с тем фактически отсутствуют данные, характеризующие реальное выполнение учебной программы по физической культуре в вузе и ее реальный вклад в

динамику уровня физического развития и здоровья студентов, в формирование мотивационноиенностного аспекта личностной физической культуры студента на различных этапах обучения. До сих пор не раскрыта динамика становления физической культуры студентов в процессе освоения ими данного вида культуры через учебную дисциплину «физическая культура» (Егорычев и др., 2006). Отношение студентов к физической культуре и спорту – одна из актуальных социально-педагогических проблем. Физическая культура играет значительную роль в профессиональной деятельности бакалавра и специалиста, так как их работа, как правило, связана со значительным напряжением внимания, зрения, интенсивной интеллектуальной деятельностью и малой подвижностью (Гендини др., 2004). Познание себя самого является необходимым условием обеспечения жизнедеятельности специалиста в условиях современных воздействий внешней среды. Формирование физической культуры личности будущего специалиста при этом немыслимо без умения рационально корректировать свое состояние средствами физической культуры и двигательной деятельности. Теоретический и методикопрактический разделы учебной программы дисциплины «физическая культура» являются наиболее сложными для реализации в образовательном процессе, поэтому чрезвычайно актуально получение отсутствующих в настоящее время данных о том, как отражается реальное изучение дисциплины «физическая культура» на фактическом формировании личной физической культуры студентов, с тем чтобы наметить пути совершенствования учебного процесса в целом (Ильинич, 2005; Кобяков, 2004).

Ключевые слова: физическая культура, нордическая ходьба, оздоровительная модель, физическое воспитание, двигательная активность, анкетирование, физическое упражнение, личность, деятельность.