

Formation of Readiness of Future Physical Culture Teachers for Professional Activity

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Abstract The article substantiates the experimental program of the formation of future physical culture teachers' readiness for professional activity at school. The level of the students' motivation for physical and health care activities was found out; the level of physical fitness of students was examined; the levels of activity component formation of the students were determined. The investigation was conducted in Zhytomyr Ivan Franko State University in 2016–2018. 364 students of the faculty of physical education took part in the investigation. The students were tested through the next exercises: for male students – 100-m race, pull-ups, 3000-m race; for female students – 100-m race, push-ups, 2000-m race. Research methods: conceptual and comparative analysis, structural and systematic analysis, synthesis, generalization, testing, questionnaire survey, observation, experiment, statistical analysis. At the end of the experiment, the level of physical qualities was found to be significantly better ($p < 0.001$) among the students of EG, in comparison to CG. It is determined that the number of the students of EG who have a high level of the activity component of the future physical culture teachers' readiness is increased at the end of the experiment comparing to CG, that proves the efficiency of the experimental program.

Keywords Student, Future Physical Culture Teacher, Physical Education, Physical Culture

1. Introduction

Nowadays one of the important tasks in Ukraine is the concern for the health of the younger generation, which would be ready for dynamic creative activity in all spheres of life of a democratic society [1-4]. That is why there is a need for highly-qualified specialists in physical culture who would be prepared for the professional activity in modern living conditions because large mental loads of pupils at school, sedentary lifestyle (free time is spent with the computer, tablet, smartphone), bad ecology and inappropriate nutrition lead to health deterioration [5-8].

In order to maintain the working capacity of an organism, regular physical exercises are required [9-13]. That is why there is a need to improve the content of physical education classes in order to make schoolchildren interested in performing physical exercises both in classes and independently at home. Therefore, the problem of acquiring knowledge about different types of independent physical and health care classes by pupils is relevant. And its solution is possible if the readiness of the future specialists in physical culture for the work at school, in particular, encouraging pupils to perform health-improving physical exercises by themselves, is improved.

At the same time, the analysis of literary sources [14-16] showed that the efficiency of the future professional activity of physical culture teachers mostly depends on their personal physical fitness, health and the level of motivation for regular and systematic physical exercises, motor activity. Additionally, according to the data of a number of scientists [17-20], the level of interest and motivation of the students of the faculties of physical education of pedagogical higher educational institutions for physical activity, as well as their level of physical fitness, is insufficient to ensure their readiness to teach in the future. In general, and, in particular, need to encourage pupils' physical and health care activities.

1.1. The Aim

The aim of the work is to investigate the efficiency of the implementation of the experimental program of the formation of future physical culture teachers' readiness for professional activity.

1.2. Tasks

1. To find out the level of the students' motivation for physical and health care activities at the beginning of the pedagogical experiment;
2. To investigate the level of physical fitness of the students of EG and CG at the beginning and at the end of the pedagogical experiment;
3. To determine the levels of the activity component formation of the students of EG and CG readiness for professional activity

2. Materials and Methods

2.1. Participants

The experimental investigation was conducted in Zhytomyr Ivan Franko State University in 2016–2018. 364 students of the Faculty of Physical Education (199 male and 165 female students) took part in the investigation. The experimental (EG, n=182, 97 male and 85 female students) and control (CG, n=182, 102 male and 80 female students) groups were formed. The control and experimental groups were formed with the help of random selection. The students of CG had classes in physical education according to the current program, and the students of EG had classes in physical education according to the experimental program and performed the practical tasks of the special course «Independent physical and health-improving activities of schoolchildren» that we developed [21]. Checking the level of their physical fitness at the beginning of the experiment showed that the groups are significantly identical – in terms of the development of physical qualities indicators of students of EG and CG did not differ

significantly ($p>0.05$).

This study complies with the ethical standards of the Act of Ukraine «On Higher Education» No. 1556-VII dated 01.07.2014 and the Letter from the Ministry of Education and Science of Ukraine «On the Academic Plagiarism Prevention» No. 1/11-8681 dated 15.08.2018, and also the principles of the Helsinki Declaration of the World Medical Association – ethical principles for medical research involving human subjects. Informed consent has been obtained from all individuals included in this study.

2.2. Research Procedure

During the physical education, practical training students of the CG were engaged in the current educational program, which included different sections: track and field, athletics, sports games and others. The experimental program was designed in such a way that first of all it would interest the students to exercise – the curriculum included comprehensive classes on the Crossfit and Pilates system (up to 80% of all classes), the staff of the department of physical education introduced professional instructors in Crossfit and Pilates, modern sports equipment and sports facilities and gyms were purchased.

In order to solve the first task, a questionnaire survey was carried out among the students of EG and CG, according to the authors' questionnaire identifying the main motives that encourage students' physical exercises and sport and the reasons that prevent them from engaging in physical activity on their own. The questionnaire, which conducting a study of students' motivation to exercise and to a healthy lifestyle, was designed by us, taking into account all the requirements for sociological research. The questionnaire contained 20 questions that allowed a comprehensive study of the attitude of students of different sex to exercise and healthy lifestyle at the beginning of their studies at the Faculty of Physical Education in order to take into account these issues during the design and implementation of the experimental program.

To solve the second task, the students of EG and CG were tested to determine the level of the basic physical qualities development at the beginning and at the end of the experiment through the next exercises: for male students – 100-m race, pull-ups, 3000-m race; for female students – 100-m race, push-ups, 2000-m race. The assessment was carried out in accordance with the Regulations on state tests and standards of assessment of physical fitness of the population of Ukraine. Testing took place in the morning. The uniform is sportswear. The results were recorded by the teachers of the Department of Physical Education. 100-m race is an exercise for checking the level of speed development. Upon command «Take your marks» the students got to the starting line in the high start position and kept stationary. At the starter signal, they quickly overcame the specified distance. Two participants participated in the race, for each participant time is being recorded separately.

Only one attempt was allowed. The result of the test was the distance traveled correct to the nearest tenth of a second. The exercise was performed at the stadium in compliance with all sanitary and hygienic standards.

Power qualities of students were determined by the results of pull-ups (male), push-ups (female). The male student stood under the crossbar, grasped from above (palms forward) took up the crossbar at shoulder width, arms straight. Upon command, he flexed his arms and pulled himself to a position where his chin was above the crossbar. Then the student straightened his arms completely, lowering himself in height. The result of testing was the number of error-free pull-ups. Each student was allowed only one approach to the crossbar. It was not allowed to swing during pull-ups, to do extra movements of the legs. Bending and extension of the arms in the push-up position was performed from the initial position: arms straight at shoulder width, torso and legs forming a straight line, toes resting on the floor. One attempt is made to complete. The result of testing was the amount of unmistakable flexion and extension of the arms. The score was announced after fixing the starting position (hands straight) and was a permission to continue the exercise. When bending the arms, it was necessary to touch the chest support. It was forbidden to touch the supports of the hips, to change the direct position of the body and legs, to lie down on the floor.

2000-m and 3000-m races were used to test students' endurance levels. Upon command «Take your marks», students got to the starting line in a high start position. Upon command «Go», students started running, trying to overcome the distance as quickly as possible. The result of the test was the time to overcome the distance with pinpoint accuracy. Running was performed on the racetracks of the stadium.

In order to solve the third task and to determine the efficiency of forming the activity component of the experimental program, the methodology by O. V. Smirnov and R. A. Smirnova [22] which involves the definition of three levels (high, medium, low) of the future specialists' in physical culture readiness was applied.

The activity component of the future physical education teachers' readiness for professional activity school (motor skills, physical fitness) was manifested in the physical perfection of the future specialist, who has such levels of health, physical development and readiness that allow him/her to use professional skills in future activities. Also, the activity component provided for the students' ability to: use productively various types of independent physical and fitness activity in the development of physical qualities, active rest, disease prevention; to teach students to perform physical exercises properly by developing the need for them to engage in self-improvement activities; to provide counseling and methodological assistance to pupils on independent physical-fitness activity. The method of O. V. Smirnov and R. A. Smirnova included surveys of students of EG and CG and their teachers on the scale developed by

the authors. While filling in the questionnaire, the student evaluated each item within three points (high level – 3 points, medium – 2 points, low – 1 point). This scale was also used by the expert (teacher) during the student assessment. The total score was the final grade. If a student received from 17 to 24 points, it meant a high level of activity component performance, 9–16 points – medium, 1–8 points – low.

A set of modern general scientific methods was used to fulfill the aim and realize the tasks of the research. They include theoretical methods (the method of conceptual and comparative analysis, structural and systematic analysis, synthesis, generalization), empirical methods (testing, questionnaire survey, pedagogical observation, pedagogical experiment), as well as methods of mathematical statistics. During the researches the authenticity of difference between the indicators of students by means of Student's t-test was determined. The dynamics of indicators in each of groups was also estimated. The significance for all statistical tests was set at $p < 0.05$. All statistical analyses were performed with the SPSS software, version 21, adapted to medical and biological researches.

3. Results

To find out the level of the students' motivation for physical exercises and increase of their motor activity, we conducted a questionnaire among the students of EG and CG at the beginning of the experiment according to the authors' questionnaire. At the beginning of the experiment, the main motives that encourage students' physical exercises and sport and the reasons that prevent them from engaging in physical activity on their own were defined. It was determined that the students' dominant motives are health improvement, development of physical qualities, body shape improvement and getting rid of body defects. The studies also show that there is a difference in the significance of motives of male and female students. Therefore, achieving sports results is in the 5th place for male and in the 10th place for female students; the desire to be attractive and to be loved by others is in the 8th place for male and in the 4th place for female students; the desire to lose weight is in the 10th and the 3rd places respectively (Table 1).

The main reasons that prevent students from engaging in physical activity and sport on their own are the lack of free time which is mentioned by 61.5 % students, laziness – 35.9%, the lack of proper conditions for classes – 24%, diseases and injuries – 16.8%, the lack of desire – 12.2% and others (Table 2). The analysis of the reasons shows that students entering higher educational institution have a very low motivation for healthy lifestyle, they are not able to manage their free time, are more interested in watching TV, resting, etc.

Table 1. The motives encouraging students to perform physical exercises and sports (rank position, n=364)

Motives	Gender	
	Male	Female
Health improvement	2	1
Physical characteristics development	1	7
Body shape improvement	3	2
Achieving sports results	5	10
Desire to acquire new knowledge, skills and abilities	4	9
Enjoying the classes	6	5
Self-assertion	7	8
Rest from mental work	9	6
Desire to be attractive and to be loved by others	8	4
Desire to lose weight	10	3

Table 2. The reasons that prevent students from engaging in physical activity and sport (% , n=364)

Reasons	Gender	
	Male	Female
The lack of free time	67.6	52.4
Laziness	29.5	35.4
The lack of proper conditions for classes	23.8	15.9
Diseases and injuries	10.5	28.0
The lack of money for inventory, uniform and gym membership	12.4	7.3
Low level of comfort of sports facilities	8.6	7.3
The lack of healthy lifestyle social support	5.7	7.3
Low level of physical development and fitness	4.8	12.2
Low level of promotion of physical culture	7.6	6.1
Negative example of deputies, politicians and statesmen	10.5	2.4
The lack of sports clubs and fitness centers	1.4	13.4
Negligent attitude towards health	11.4	11.0
The lack of incentives to improve health	5.7	9.6
The lack of sports competitions for everyone	9.5	4.9
The lack of knowledge about modern methods of training	5.7	2.4
Shame of mates and other people	3.8	-

The analysis of the answers to the question how many hours per week they take exercises showed that 46.2% of male students mentioned that they took exercise for 1–2 hours per week; 17.9% – for 3–4 hours; 3.8% – for 5 hours and more; in addition, 31.9% students answered that they did not take any exercises (missing the regular classes). The answers of female students are similar to the ones of male – the majority of female students took exercise for 1–2 hours per week (37.5%); 34.1% female students did not take any exercises; 9.4% – took exercises for 3–4 hours per week. The analysis of the students’ answers to the question how they spend their free time revealed that 44.7% male students and 49.3% female students spent their free time on social networks, computer games, watching television programs; 26.6% male students and 23.2% female students – on friends or family; and only 7.5 and 6.4% male and female students respectively took exercises. The conducted analysis proved a low level of motivation of modern students (even the future teachers of physical culture) for physical exercises and health care activities. It should be

considered in the process of implementation the author’s program of the formation of future physical culture teachers’ readiness for professional activity.

We created a program of the formation of future physical culture teachers’ readiness for professional activity, based on the works of many scholars [5, 10, 11, 14-16, 18, 23-30]. The main objectives of the experimental program are: increasing the interest and motivation of students to physical culture, physical exercise and sports; increasing the level of general physical fitness; improving the physical condition and strengthening the health of future physical culture teachers; involving students in systematic physical exercise and sports; promoting a healthy lifestyle; increasing the efficiency of future professional activities. Physical education classes according to the experimental program conducted in accordance to the general structure of the lesson, which consisted of three parts: preparatory, main and final. Students of the experimental group followed the methodology we proposed, according to which 60–80% of the exercises was designed for the

implementation and in-depth study of modern means of physical education (Crossfit and Pilates). In the preparatory part of the lesson, warm-up activities were carried out. Towards the end the sets of exercises designed for stretching of muscles were included. The main part – the Crossfit and Pilates – exercises which were aimed at students' general physical training and increasing the functional capabilities of different systems of the body. In the main part of the lesson, the sequence of physical exercises was as follows: firstly, exercises for speed were performed, then for strength, and in the end – for endurance. Exercises were carried out with high intensity. In the final part of the lesson, stretching exercises were performed. The advantages of Crossfit and Pilates, in comparison with traditional means of physical education and sport, are: the lack of equipment costs (most exercises are done with the weight of one's own body); a short period of time is required to do a set of exercises; a possibility of organizing outdoor training, in a sports hall, within a limited space; a possibility of organizing training with a large group of students; a wide range of simple and accessible exercises eliminates the adaptation to the same type of physical load; a possibility of conducting training with students of different genders and with different levels of physical fitness. The physical load was distributed taking into account the physical condition of student by changing the number of repetitions, approaches and duration of rest, etc. The main principle of combining exercises in sets is variation.

The main components of the future physical culture teachers' readiness for professional activity are determined to be activity and motivational ones. Activity component is the basic component that promotes the transformation of theoretical knowledge about physical culture and exercises into practical skills. The activity component of the readiness of graduate students for professional activity is revealed in the physical perfection of an individual which has the levels of physical development that allow to use the acquired knowledge in the future in vocational schools and in practice. Theoretical knowledge will help the future specialist in physical culture to master physical exercises qualitatively, to develop the need and habit to be engaged in independent physical health-improving activities because a teacher can explain pupils to do physical exercises correctly only when one can skillfully perform them. That is why the experimental program aimed on the formation of the skills and abilities of future physical education teachers to exercise independently, the awareness of the need to be healthy, the choice of kind of independent physical health-improving exercises and self-control.

During the pedagogical experiment, the students of CG were studying according to the current program of physical education, and the EG students – according to the experimental program and, in addition, they performed the practical tasks of the special course «Independent physical

and health-Improving activities of schoolchildren» that we developed, in particular, they were taking orientate exercises for home tasks in physical culture (the 5th– 11th grades), morning gymnastics complexes and physical training breaks. During the process of learning the program of the special course, in addition to giving knowledge about the types of independent classes, we formed the future physical culture teachers' ability to organize independent physical health-improving activities that was aimed not only at the development of physical qualities of pupils, but also at the professional content of classes. In our opinion, the first step towards independent physical health-improving exercises is homework, because in the process of its daily performance pupils acquire the necessary knowledge, skills and abilities to perform physical health-improving exercises on their own. Successful performance of homework by pupils depends on the teacher of physical culture, in particular, on his experience, abilities, creative qualities. That is why, in practical classes, students learned to select physical exercises for homework, to systematize and plan them, taking into account the content and tasks of the curriculum, the possibilities of development of physical abilities of pupils, their age and gender.

In order to study the efficiency of the implementation of the experimental program of the future physical culture teachers' readiness, we analyzed the level of physical fitness of students of different genders at the beginning and at the end of the experiment (Table 3). The analysis of the results in 100-m race showed that both male and female students' of both groups speed developing indicators have the uptrend during the experiment, but the difference in the initial and final data is not authentic ($p>0.05$). The analysis of the male students' results in pull-ups showed that the results of EG were 5.6 reps increased ($p<0.001$) and the results of CG were not changed authentically during the experiment ($p>0.05$). The female students have a similar trend – the results of EG in push-ups were 8.8 reps increased ($p<0.001$), and the results of CG were 1.3 reps increased ($p>0.05$). Comparing the results of EG and CG at the end of the experiment, we determined authentically better physical characteristics development indicators of EG, in contrast to CG (by 4.5 reps for male and 7.7 reps for female) that proves a positive effect of the implementation of the experimental program.

The examination of the results in endurance exercises proves that the indicators of both male and female students of CG were improved, but they were not changed authentically during the experiment ($p>0.05$), and the results of male students from EG in 3000-m race were 1 min 31 sec improved and the results of female students from EG in 2000 m race were 1 min 27 sec improved authentically ($p<0.001$). The results authentically prove the high efficiency of classes according to the experimental program.

Table 3. The dynamics of physical fitness of the students of EG and CG during pedagogical experiment (n=364, X±m)

Tests	CG (n=182)			EG (n=182)		
	Stages of the experiment		p	Stages of the experiment		p
	The beginning	The end		The beginning	The end	
Male students (CG – n=102; EG – n=97)						
100-m race, sec	14.3±0.09	14.2±0.08	>0.05	14.4±0.08	14.0±0.08	>0.05
Pull-ups, reps	9.3±0.46	10.2±0.45	>0.05	9.1±0.53	14.7±0.47	<0.001
3000-m race, sec	869.3±9.81	860.1±9.64	>0.05	871.2±9.58	779.7±9.03	<0.001
Female students (CG – n=80; EG – n=85)						
100-m race, s	17.4±0.12	17.1±0.10	>0.05	17.3±0.10	16.8±0.11	>0.05
Push-ups, reps	13.2±0.65	14.5±0.59	>0.05	13.4±0.62	22.2±0.65	<0.001
2000-m race, s	802.5±8.57	793.3±9.03	>0.05	806.1±9.10	719.4±8.63	<0.001

Table 4. The ratio of the activity component levels of the future physical education teachers' readiness for professional activity (% , n=364)

The activity component levels	CG (n=182)		EG (n=182)	
	The beginning of the experiment	The end of the experiment	The beginning of the experiment	The end of the experiment
High	12.1	16.5	13.7	46.7
Medium	63.2	65.4	59.3	48.9
Low	24.7	18.1	26.9	4.4

In order to check the formation level of the activity component of the readiness of the future specialists in physical education for professional activity, we used the method of questioning: answering the questions, future specialists showed their abilities and skills to use knowledge in practice, in particular, to choose and apply methods of development of motor qualities, to form complexes of physical exercises, to find solutions in difficult situations, to conduct diagnostic control on a preclinical level. The results of the activity component of readiness formation are shown in Table 4.

Having compared data of experimental and control groups' work, we concluded that at the beginning of the experiment, the ratio of EG and CG students by activity component levels was almost the same. After the implementation of the experimental program, the number of EG students with a high level of activity component increased from 13.7% at the beginning of the experiment to 46.7% at the end of the experiment. At the same time, the number of medium and low levels EG students decreased from 59.3% and 26.9% to 48.9% and 4.4%, respectively. The number of CG students with high, medium, and low levels of activity component did not change substantially during the experiment. Comparative analysis of the ratio of students by different levels of activity component at the end of the pedagogical experiment showed that the number of EG students with high level is 30.2% higher than in CG, and with the medium and low levels are 16.5% and 13.7% lower respectively, that confirmed authentically the advantage of the experimental program over the traditional one.

4. Discussion

According to the results of conducted investigation, the levels of formation of the activity component of the future physical education teachers' readiness for professional activity were grounded, that is high, medium, and low levels.

The high level of the future physical culture teachers' readiness is characterized by a deep understanding of the socially important essence of their profession, high level of motivation for achieving success in professional activity, high personal level of physical fitness. Future specialists of this level are distinguished by extensive knowledge about different types of independent physical health-improving activities, skills and abilities to use them in practice, and creative productive thinking. They are regularly engaged in self-education, physical exercises, they master personality-oriented technologies, can find a solution in difficult situations, critically evaluate themselves, their professional skills. They master diagnostic methods at the preclinical level and can give methodically competent advice on adjusting loads while performing physical exercises. They have perfect knowledge about the techniques of self-control.

The medium level of the future specialists' in physical culture readiness is characterized by unsustainable interest in professional activity, an average level of motivation for achieving success, a moderate desire for self-improvement, and an average level of physical fitness. The future specialists have the proper knowledge about different types of independent work, personal-oriented technologies and want to use the acquired knowledge, skills and abilities in

practice. The students have a satisfactory level of critical attitude towards their personality, their professional qualities. They are able to identify and estimate the physical fitness of an organism, to use objective and subjective methods of self-control.

The low level of the future physical culture teachers' readiness is characterized by occasional interest in professional activity, a low level of physical fitness, indifferent attitude towards achieving success in this activity. The students of this level have limited knowledge about different types of independent physical health-improving activities, primitive skills and abilities to use them in practice; they do not show interest in learning. The students acquire knowledge formally. They are not engaged in physical exercises, self-education and self-improvement. The students have a low level of critical attitude towards their personality, their professional qualities. They have a general idea about the definition and evaluation of the physical fitness, the use of techniques of self-control.

According to the results of the students' level of physical fitness evaluation, it can be concluded that there is a positive effect of the experimental program – the indicators of the EG students (both male and female) are significantly better ($p < 0.001$) than the CG students at the end of the pedagogical experiment in the exercises on the power and endurance development.

Having compared the results of the formation of the activity component of readiness in experimental and control group, positive changes in the experimental groups' performance can be noted. It confirmed our assumption that a person will be engaged in independent health-improving activities when one has the need to monitor the state of one's health formed, because a teacher is a creative person whose professional activity is based on the personality developing interaction in the system «teacher-student». The students' skills to create the exercises complexes for morning gymnastics, to choose physical exercises for physical training breaks and homework in physical culture will help them in their future professional activity to teach pupils how to perform physical exercises independently. The results of our research confirm the conclusions of the works of many scientists [2, 4, 6-8, 11, 14, 18, 25, 26, 31-34].

5. Conclusions

1. The conducted questionnaire of students at the beginning of the experiment showed a low level of students' motivation for physical health-improving activities. Among the main dominant motives that encourage students to perform physical exercise and sports is health improvement, development of physical qualities, body shape improvement and getting rid of body defects. The main reasons that prevent students from engaging in physical activity on their own are lack of free time, laziness, lack of proper conditions for classes, lack of desire.
2. The results of checking the level of the students' physical fitness determined a positive effect of the implementation of the experimental program of the formation of future physical culture teachers' readiness for professional activity – the indicators of the EG students are significantly better ($p < 0.001$) than of the CG students at the end of the experiment. Comparing the results of EG and CG at the end of the experiment, we determined authentically better physical characteristics development indicators (power and endurance) of EG comparing to CG (by 4.5 reps for male in pull-ups, by 7.7 reps for female in push-ups, by 1 min 31 sec for male in 3000-m race, by 1 min 27 sec for female in 2000-m race) that proves a positive effect of the implementation of the experimental program.
3. It is determined that the number of EG students with high level of the activity component of the future physical culture teachers' readiness at the end of the experiment is 30.2% higher than in CG, and with the medium and low levels are 16.5% and 13.7% lower respectively, that proves the efficiency of the experimental program.

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