



Model of Preparation of Future Teachers for the Development of School Students' Health Culture

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ABSTRACT

The purpose of the study is to substantiate and experimentally test the model of preparing future teachers for the development of school students' health culture. The latter is considered an integral part of the general culture of the teacher, which reflects a set of health competencies and values that ensure a healthy lifestyle, the formation and strengthening of health, both their own and students'. The model of preparation of future teachers for the development of health culture of secondary school students reflects the purpose, objectives, content, forms and methods of this pedagogical process and its result – the professional readiness of students for future teaching. Its implementation is aimed at becoming students of higher educational institutions as subjects of health culture. The effectiveness of the proposed model is ensured by compliance with a set of organizational and pedagogical conditions, such as the implementation of a personality-oriented approach in the process of training future teachers; use of interdisciplinary connections in the educational process; proper educational and methodological support on the basis of modern information technologies; comprehensive and systematic control of students' academic achievements.

Keywords: Professional Training, Health Culture, Healthy Lifestyles, Future Teachers, School Students

1. Introduction

1.1. The current state of health of children and adolescents in Ukraine

List Health is a universally recognized value of the world community, an important indicator of the development of states, which reflects the level of their social and economic status. According to UN Resolution №38/54 of 1997, public health is considered the main criterion for the expediency and effectiveness of all spheres of human life (Yaremenko et al., 2000). According to the WHO, only 15% of human health is determined by genetic predisposition, the same percentage is the effectiveness of the health care system, while 70% depends on lifestyle and nutrition (Pasichnyuk, 2018). At the same time, about three quarters of diseases in adults are the result of the living conditions in which they were in childhood and adolescence (Nosko & Arkhipov, 2019).

Today in Ukraine the state of health of the population is of serious concern, and the tendency to its deterioration has reached a threatening level. This is due to the impoverishment of a large part of the population, a sharp decline in general culture and efficiency, deteriorating environmental situation, the spread of destructive stereotypes, increasing illegal drugs and alcoholism, reduced access to quality medical services, health expense of modern education.

Thus, the industrial strain on the environment from emissions of enterprises per 1 sq. km. of Ukraine is about 6.5 tons, which is more than 80 kg per capita per year. The country has not yet gained serious experience in the field of waste disposal: only 5-10% of waste is recycled, and the rest is accumulated in the form of landfills, which become objects of environmental danger ("National Library", 2020). Of the 6 million residents of the anti-terrorist operation area and adjacent territories, more than 5 million fell into either the group of suddenly impoverished or the group vulnerable to poverty, regardless of whether they moved to another part of Ukraine or remained in their place of residence (Moiseenko, Dudina, & Goyda, 2017). In Volyn region there is only one medical station for five schools and in Trans Carpathian region there are only 10 doctors and 228 nurses serving 735 institutions (Prystupa, Vovkanych, & Petryshyn, 2015). According to the Ministry of Internal Affairs, more than 107,000 drug addicts are officially registered in Ukraine, but in reality this figure is 10-15 times higher and amounts to more than 1 million. At the same time, 95% of drug addicts are young people aged 15-30. 97% of addicts first try drugs between the age of 12 and 19, and one in five addicts is a woman (Hradetsky, 2012). 45% of boys and 35% of girls smoke, 76% of adolescents have experience of alcohol consumption, 15% started drinking alcohol at the age of 11 (Moiseenko, Dudina, & Goyda, 2017).

The health of children and school students is of particular concern. Against the background of declining child population, only 10% of high school students can be considered healthy, 40% of secondary school students are chronically ill, another 50% of schoolchildren have morpho-functional abnormalities (Boychuk, 2017). As a rule, one teenager has several diseases at a time, a significant part of which has significantly "rejuvenated" in recent years (Antypkin et al., 2018; Murza, 2005). There is low physical activity of schoolchildren, the prevalence of bad habits, increasing frequency of obesity, which forms a low tolerance to exercise, reduced adaptability and reserves of various body systems, deteriorating quality of life of children in general (Kovtyuk et al., 2013). As a result, only 30% of school-age children can meet the standards of physical training without risk to health (Bashavets, 2013). With deteriorating health, children and adolescents are undermining the social and cultural values of education and physical education. This requires not only a thorough study of the causes of these processes, but also the development of effective ways and mechanisms for a comprehensive solution to the problem of maintaining and strengthening the health of students, which is the purpose of our study.

11.2. The problem of health preserving of school students in the context of professional and pedagogical training of teachers

Achieving success in professional activities requires proper health of the teacher, which allows the required level of their ability to work and determines the stability and quality of the planned results. In the hierarchy of factors of creative potential, career growth, active life and self-realization of the teacher, the state of health has a leading place (Meshko, 2013). Health is one of the main indicators and an important factor that determines the effectiveness of the teacher, and hence determines their readiness for professional activity.

At the same time, the state of health of school students, their vitality and social and psychological well-being largely depend on the quality of professional training of a teacher, their personal characteristics. After all, a teacher is a subject of pedagogical activity and modern culture, a bearer of socially expected style of behavior and way of life. By their own example, they can provide students with clear and understandable life guidelines, thus enabling the creation of a healthy educational environment in the secondary school. And only the teacher who cares about their health leads a healthy lifestyle, is able to effectively contribute to the preservation and strengthening of the health of their students, to ensure the formation of an appropriate culture.

The formation of a valued attitude to one's own health, skills of a healthy lifestyle should begin in childhood, which requires purposeful preparation of students of higher pedagogical educational institutions for the development of a culture of health of schoolchildren. Although the upbringing of a responsible attitude to one's own health and the health of others is determined by one of the priorities of education, in practice this issue is not given necessary attention, which causes some difficulties for university graduates in their further professional activities (Bozhyk, 2014; Naumchuk, 2018; Ohnysty & Ohnysta, 2016). Despite public attention to the problem of healthcare, the introduction of educational reform "New Ukrainian School" has not yet managed to create an environment in educational institutions that provides each child with comfortable studying conditions, optimal exercise and physical activity, the basis for academic performance and healthcare (Bashtovenko, 2018).

This necessitates the formation of the future teacher's personality on the basis of their responsible attitude to their health and leading a healthy lifestyle as the highest individual and social value, ability to ensure the proper level of health of children and school students in all its manifestations - spiritual, mental, physical. Additional significance of this problem is given by modern requirements of society to the professional activity of a teacher, which should provide appropriate conditions for comprehensive and harmonious development of the school student's personality based on universally recognized cultural values and ideals, where health, harmony of spiritual and physical strength take their place.

2. The Purpose of the Study

is to develop and experimentally test a model of preparation of future teachers for the development of health education of students of secondary schools. To achieve this goal the following tasks were set:

- to determine the structure of readiness of future teachers for the development of school health culture, its components, criteria and levels;
- to find out the content of professional training of future teachers for the development of health culture of students of secondary schools and organizational and pedagogical conditions of its provision;
- to compare the obtained results of professional training of future teachers in control and experimental groups.

3. Materials and Methods

To achieve the goal and solve problems, a research program was developed, which provided the use of a set of interrelated methods, namely:

- theoretical: analysis and generalization of scientific information on the problem of research, educational and methodological and regulatory documentation; analysis, synthesis, generalization and systematization of theoretical and experimental data; modeling the training of future teachers for the development of health culture of students of secondary schools; comparison of the obtained experimental data;
- empirical: observation of the educational process; conversations with students, teachers, lecturers; interviews with them; student survey; pedagogical experiment; methods of mathematical processing of the obtained results.

The research was conducted on the basis of two higher educational institutions of Ukraine. The pedagogical experiment involved 202 university students and 35 lecturers, as well as 198 secondary school students.

The division of students into control and experimental groups was carried out on the basis of determining the entry level of readiness of future teachers to develop a culture of health of students. Initially, the level of formation of each of the components of readiness was set, namely, motivational, content and activity. To determine the level of formation of the motivational component of readiness, the following diagnostic tools were used: the method of diagnosing the level of health culture as a worldview of future teachers, developed by Shkityr (2003), self-assessment of future teachers according to Voitenko (1991) and methods of incomplete sentences to study the attitude of student youth to self-destructive behavior (Musayelyan, 2016). The level of formation of the content component of readiness was determined in the process of studying the triad of disciplines - "Physical Education", "Valeology", "Life Safety", using current, boundary and final control and evaluation of knowledge necessary for the formation of health culture. Execution of tests and standards for the annual assessment of physical fitness of the population of Ukraine ("Verkhovna Rada", 2020), individual health test by Yatsuk (2017), the establishment of a healthy lifestyle index (HLI) (Meleha, Klyap, & Chorey, 2018) provided a definition of the level of activity component of the studied readiness. Obtaining experimental data on each component of the readiness of future teachers to develop a culture of health of students allowed to determine the level of its formation in general.

Methods of mathematical statistics were used to process the results of the pedagogical experiment and check their reliability. The variances were compared to determine Fisher's F-test, the numerical values of the empirical value of which are given in the standard table of F-values (Kyveryalg, 1980).

Determination of the F-criterion was performed using formula (1):

$$F_{emp} = \frac{\sigma_1^2}{\sigma_2^2} \quad (1),$$

where σ_1^2 is the greater variance; σ_2^2 is the less variance.

To calculate the variances, we used the following formula (2):

$$\sigma^2 = \frac{\sum f(x_i - \bar{x})^2}{N} \quad (2),$$

where f is the number of students with a certain level (indicated by digital indicators "5", "4", "3", "2") of the formation of the readiness of future teachers to develop the health culture of school students;

$(x_i - \bar{x})$ is the difference between the values of each level in digital values (5, 4, 3, 2) and the average score (AS);

N is the number of students in those categories of groups (control or experimental), where the variance was calculated.

Calculations to determine the F-criterion for control and experimental groups were carried out in accordance with the formation of each component, and in general the readiness of future teachers to develop health culture of

school students.

4. Results and Discussion

4.1. *The structure of readiness of future teachers for the development of school students' health culture*

The process of teacher training is considered in inseparable connection with the content of their activity. On the basis of the analysis of professional activity of the teacher it is possible to conduct the directed search of mechanisms of its formation. The main goal of teacher training in higher education is the formation of the subject of learning - a creative personality, who, in the context of our study, is able and ready to ensure the formation and development of health culture.

To date, there is no single definition of "health culture", due to the complexity and multidimensionality of this phenomenon, the simultaneous finding of its structural elements in different areas of knowledge, the difference in methodological approaches and research objectives. In the scientific space, the culture of health is considered as: integrated education of the individual (Kryvosheyeva, 2001; Babych, 2015), as the degree of human perfection (Baronenko & Rapoport, 2003), as the ability to live (Shkityr, 2003; Skumin, 1994), as a set of psychological, pedagogical and medical knowledge (Melnyk, 2012), etc.

The culture of health is also defined as a field of pedagogy that studies the theory and develops the practice of preserving and strengthening human health (Horashchuk, 2004; Kyrylenko, 2004; Babatunde, 2017). It is an integral part of the overall culture of the individual, reflecting a set of health saving competencies and values that ensure a healthy lifestyle, the formation and strengthening of health - their own and others. At the same time, the culture of health is the optimal personal state of the teacher, which implies the presence of motivational and value attitude to professional activity, possession of effective means and ways to achieve pedagogical goals, the ability to be creative and reflective.

In this context, the readiness of future teachers to develop culture of health among students of secondary schools is the result and quality of their training at the university. Therefore, we consider this concept as an integrative sustainable education of the individual, which is a regulator and a condition for successful professional activities aimed at maintaining and promoting health, leading a healthy lifestyle, and "training future teachers for the development of health culture" is interpreted as a purposeful process of formation of students of higher pedagogical institutions as subjects of health culture.

Summarizing the theoretical provisions proposed by various researchers (Ohienko et al., 2016; Chichikin, 1995; Mefanik, 2020; Necheporenko, 2019; Bronnikova, 2018) on the components of pedagogical activity, we can conclude that regardless of the direction, type or characteristics, professional activity of teachers includes motivation, knowledge and information about the activity and its practical implementation. This leads to the separation of motivational, content and activity components of the professional readiness of future teachers to develop health culture of school students. Since the component is an integral part, an element of anything, the result of the combination and integration of these components is a single system of formation of this readiness in the future teacher (Fig. 1).

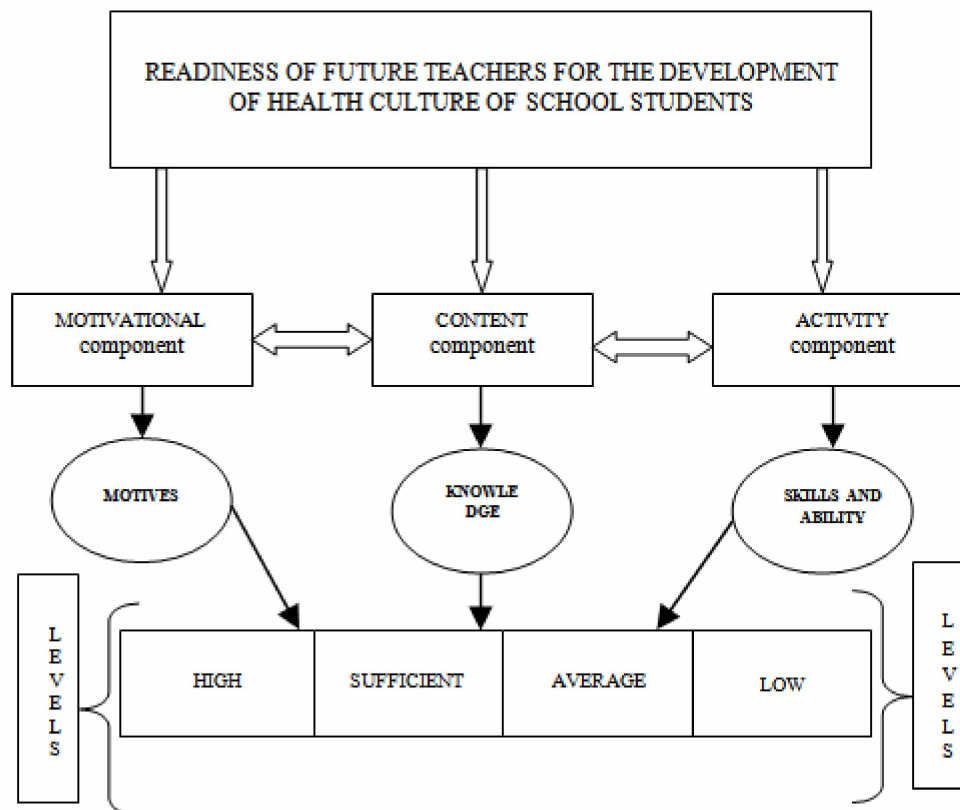


Figure 1. The structure of readiness of future teachers for the development of school students' health culture

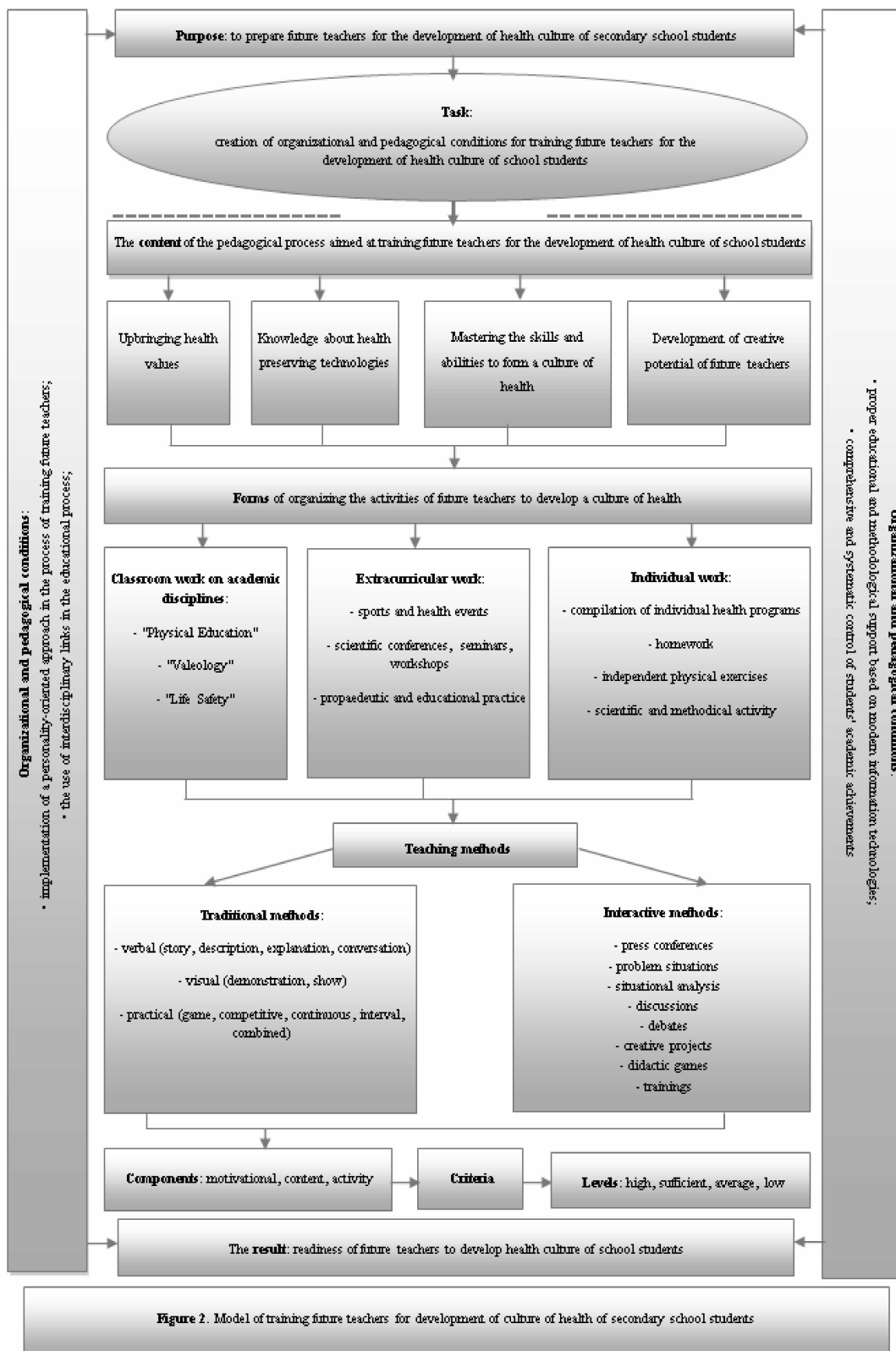
The basis of the motivational component is determined by the positive attitude of school students to learning, a stable interest in the educational process, the need to implement the acquired health competencies in future professional activities. Motive consolidates, develops knowledge, skills and practical experience (Morris, 2008; Semmar, 2006), and health care is the leading driving force in the formation, regulation and (self) control of lifestyle.

The content component is associated with professional education and involves students mastering the system of knowledge necessary for the development of health culture of school students and effective professional activity. It is the result of future teachers' understanding of the modern picture of the world, the ability to work with people and information (Tuhay, 2009). This component performs the functions of developing the activity, cognitive interests and abilities of students, improving their mental activity, where the role of information as a goal is combined with its importance as a means of mastering the algorithm of professional actions.

The skills and abilities of the individual, which ensure the safety of life and self-regulation of individual behavior determine the content of the activity component. This component reflects the interaction of the individual with the environment and has external (social, natural) and internal (personal) determinants (Melnyk, 2012). Thanks to the activity component, the student in practice realizes their desire for the ideal through conscious self-management, following the rules of a healthy lifestyle and appropriate norms of behavior.

4.2. Model of training future teachers for the development of school students' health culture and organizational and pedagogical conditions for its provision

Based on the theoretical analysis and materials of the experimental research, a model of training future teachers for the development of health culture of secondary school students has been developed, which is schematically presented in Fig. 2.



According to the presented model, the purpose of training future teachers is oriented and directly reflects the result of this complex and long-term process - the readiness of university graduates to develop a culture of health of school students. The training tasks specify the purpose and reveal the components of the readiness of future teachers to develop a culture of health of secondary school students - motivational, content and activity. The implementation of this purposeful process involves:

- upbringing of health values - the formation of the system of values of health culture of future teachers, the

corresponding motives, the need to maintain and strengthen health, to lead a healthy lifestyle, to regular exercise, as well as the formation of rejection of harmful habits;

- assimilation of knowledge about health and health-preserving technologies - a single system of organizational forms and technological units aimed at comprehensive and harmonious development of personality, preservation and strengthening of their health, which provides students with understanding of the importance of all components of health culture, valeological knowledge forming, modeling and adherence to a healthy lifestyle, personal example in the manifestations of health preserving;

- mastering the skills and abilities to form the culture of health, associated with the ability of future teachers to effectively solve the problem of preserving and strengthening the health of secondary school students, independently choose the best ways to recover, identify causes of negative phenomena, processes and shortcomings, comprehensively use health opportunities for exercise and tempering, to adequately assess the results of joint activities with school students;

- development of creative potential of future teachers, individuality and uniqueness of each personality, originality of their thinking, active and initiative behavior, which allows to improve the general culture, formation of necessary personal and professional qualities, formation of health competencies.

The model of preparing future teachers for the development of health culture of schoolchildren is provided by teaching a range of disciplines - "Physical Education", "Valeology" and "Life Safety", as well as the passage of pedagogical and industrial practices of students. This helps to identify and increasing the positive results of the interaction of different fields of scientific knowledge and aspects of training future teachers, thus combining theory and practice, teaching and professional activity in order to achieve a possible synergistic effect (Jack, Lin, & Yore, 2014; Callcott, Hammond, & Hill, 2015; Chang et al., 2015).

The main forms of preparation of future teachers for the development of school students' health culture are considered as follows: a) classroom work in the above mentioned disciplines; b) extracurricular work during the preparation and holding physical education and health and sports events, scientific conferences, seminars, workshops, as well as propaedeutic, educational practice and internship; c) independent work, the content of which consists of compiling individual health programs, doing homework, independent physical exercises, tempering, scientific and methodological activities, etc.

Implementation of the model of preparation of future teachers for the development of school students' health culture involved the use of traditional (verbal, visual and practical) and interactive teaching methods, mainly: press conferences, problem situations, situation analysis, discussions, debates, creative projects, didactic games, trainings.

Based on the established criteria and relevant indicators, the levels of formation (high, sufficient, average and low) were determined for each component of the readiness of future teachers for the development of school students' health culture.

When developing the organizational and pedagogical conditions for training future teachers for the development of health culture of secondary school students, it was assumed that they should reflect the components and structure of future teachers' readiness for future professional activity and ensure the effectiveness of this purposeful process. Our research allowed us to determine such organizational and pedagogical conditions for the formation of components of readiness for the development of health culture of schoolchildren, as:

1. Implementation of a personality-oriented approach in the process of training future teachers.
2. The use of interdisciplinary links in the educational process.
3. Appropriate educational and methodological support based on modern information technologies.
4. Comprehensive and systematic control of students' academic achievements.

The implementation of a personality-oriented approach in the process of training future teachers - the first organizational and pedagogical condition, was associated with the formation of students' responsible attitude to health as the highest individual and social value, the need to lead a healthy lifestyle, their motivation for regular physical exercise, tempering, prevention of bad habits, promotion of self-realization and self-development of future teachers.

Providing the second organizational and pedagogical condition - the use of interdisciplinary links in the educational process, provided for the integration and supplementation of knowledge and skills related to human health, in particular, in the disciplines "Valeology", "Life Safety" and "Physical Education" into a single integrated system through methodically sound teaching, which allowed to cover all aspects of the process of forming the readiness of future teachers to develop health culture of school students, as well as to ensure continuity and consistency in education.

Observance of the third organizational and pedagogical condition - proper educational and methodical maintenance on the basis of modern information technologies - consisted in providing students with necessary normative documentation, scientific and educational and methodical literature, internet resources, multimedia sets, and also introduction of interactive educational and methodical complexes with wide using the latest information technologies.

The fourth organizational and pedagogical condition - comprehensive and systematic control of student achievement, was considered in three aspects: as an element of general management of the pedagogical process, as a set of special measures of the control service and as feedback to monitor the training of future teachers. Using psychological and pedagogical and medical and biological indicators, preliminary, current, boundary and final control made it possible to continuously obtain information on the state of formation of readiness of future teachers for the development of health culture.

4.3. Experimental verification of the effectiveness of the model of training future teachers for the development of school students' health culture

Experimental verification of the effectiveness of the proposed model was carried out on the basis of assessment of the real changes that occurred in students in the process of its implementation and comparison of the results of professional training of future teachers in control and experimental groups. In table 1. and fig. 3. The results of the pedagogical experiment are presented, which through the ratio of students with different levels of professional readiness prove the effectiveness of the developed model of training future teachers for the development of health culture of students of secondary schools.

Table 1. Indicators of levels of readiness of future teachers for the development of school students' health culture

Group and number of students	Stage of control	Numerical indicators of the level of readiness of future teachers to develop health culture of school students								Average score (AS)
		High		Sufficient		Average		Low		
		Number of students	%	Number of students	%	Number of students	%	Number of students	%	
Control (93)	Original	7	7,53	26	27,96	46	49,46	14	15,05	3,28
	Final	12	12,90	34	36,56	40	43,01	7	7,53	3,55
Experimental (109)	Original	9	8,26	28	25,69	57	52,29	15	13,76	3,28
	Final	50	45,87	12	11,01	47	43,12	0	0	4,03

Statistical processing of the obtained data showed that in the experimental groups, in comparison with the control groups, there is a much higher percentage of students with a high level of professional readiness - by 32.97%. The indicators of students in the control group, which correspond to a sufficient level of readiness are slightly better compared to the experimental group, which can be explained by a significant increase in the number of students in the experimental group with a high level of readiness. However, the total percentage of students with high and sufficient levels of professional readiness in the experimental group is 7.42% higher than in the control group. At the same time, in the experimental group the students with a low level of professional readiness were not detected, while in the control group this figure is 7.53%.

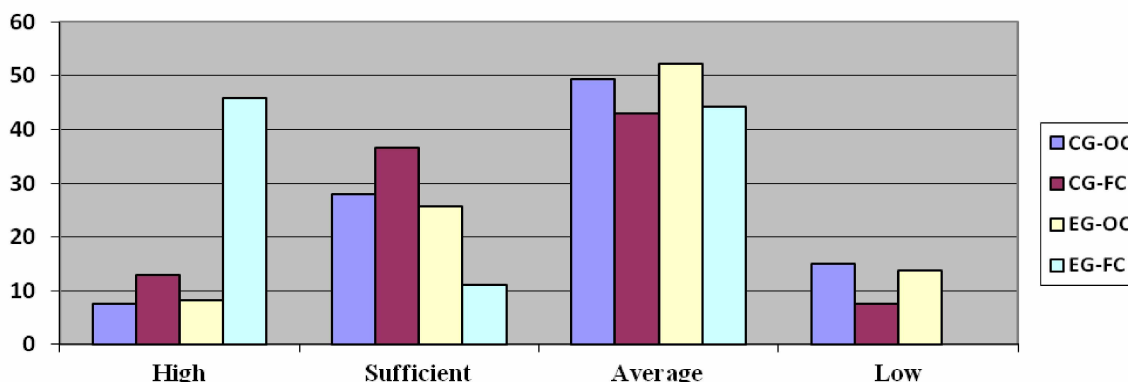


Figure 3. Levels of readiness of future teachers for the development of school students' health culture

To verify the reliability of the results of the experimental study, the indicators of the calculated F-criterion for control and experimental groups were compared with the index of the theoretical F-criterion, the numerical values of which are given in the standard table (Shkityr, 2003). The theoretical indicator of the F-criterion was established by

the number of degrees of freedom, which was determined by subtracting one from the number of students in the control and experimental groups. In the control groups, the number of degrees of freedom was 92, and in the experimental - 108. Calculations to determine the F-criterion for control and experimental groups were carried out in accordance with the formation of each component and the general readiness of future teachers to develop health culture of school students. The results of the calculation of variances are presented in table 2.

Table 2. *The results of the calculation of variances*

Components	Groups	Greater variance σ_1^2	Less variance - σ_2^2	F-criterion
Motivational	CG	0,67	0,67	1,0
	EG	0,88	0,66	1,34
Content	CG	0,64	0,62	1,01
	EG	0,91	0,64	1,43
Activity	CG	0,62	0,61	0,99
	EG	0,89	0,65	1,36
General readiness	CG	0,66	0,65	1,01
	EG	0,89	0,64	1,38

According to the standard tables, if the number of degrees of freedom is in the range of 60-120 and from 24 to infinity (which corresponds to the numerical indicators in our study), the indicator of the F-criterion is in the range of 1.7 - 1.3. Thus, the F-criterion in the experimental group with a value from 1.43 to 1.34 indicates the probability and reliability of the results of the experiment. In the control group, the positive changes in the readiness of future teachers to develop health culture of secondary school students are due to the traditional process of professional training.

5. Conclusions

The readiness of future teachers to develop health culture of school students is the result and quality of training in higher education. This is a sustainable integrative education of the individual, which is aimed at maintaining and strengthening health, leading a healthy lifestyle, acts as a regulator and a condition for successful professional activity of the teacher. The structure of this readiness is determined by the motivational, content and activity components.

The model of training future teachers for the development of school students' health culture reflects the purpose, objectives, content, forms and methods of this pedagogical process and its result - the professional readiness of students for future teaching. Its implementation is aimed at the formation of students of higher pedagogical institutions as subjects of health culture, which is ensured by compliance with such organizational and pedagogical conditions as: implementation of personality-oriented approach in the process of training future teachers; use of interdisciplinary connections in the educational process; proper educational and methodological support on the basis of modern information technologies; comprehensive and systematic control of students' academic achievements.

The theoretical substantiation and practical efficiency of the model of training future teachers for the development of school students' health culture has been experimentally proved. This is evidenced, in particular, by comparing the percentage of students in the control and experimental groups with different levels of professional development.

In our opinion, the presented materials of the article will help to better understand the significance and comprehensiveness of the teaching profession, will provide some guidelines for further improvement of professional training of future teachers, which will ultimately help to solve the problem of school health preserving in Ukraine.

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