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THE STATE OF THE PROBLEM OF TRAINING MEDICAL STUDENTS TO SOLVE PROFESSIONAL TASKS IN THE TEACHING OF BIOPHYSICS

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Abstract*. The reform of the modern medical education system is aimed at enhancing the effectiveness of training future doctors who not only possess knowledge and skills but are also prepared to apply them in solving professional tasks. The authors demonstrate the necessity of biophysics in the future professional activity of a medical specialist in solving professional tasks.*

Keywords*: biophysics, medicine, methodology, integration, contextual learning.*

СОСТОЯНИЕ ПРОБЛЕМЫ ПОДГОТОВКИ СТУДЕНТОВ-МЕДИКОВ К РЕШЕНИЮ ПРОФЕССИОНАЛЬНЫХ ЗАДАЧ ПРИ ОБУЧЕНИИ БИОФИЗИКЕ

Аннотация. *Реформирование современной системы медицинского образования направлено на повышение эффективности подготовки будущих врачей, не только обладающих знаниями и умениями, но и готовых их применять при решении задач профессиональной деятельности. Авторы показывают необходимость биофизики в дальнейшей профессиональной деятельности будущего специалиста медицинского профиля по решению профессиональных задач.*

Ключевые слова: *биофизика, медицина, методика, интегрирование, контекстное обучение.*

Introduction

Biophysics is one of the key disciplines in the educational program of medical students, including those at Tashkent Medical Academy. It is a subject based on the principles of physics for studying biological processes and phenomena occurring in living organisms. The importance of this discipline lies in providing students with basic knowledge about the functioning of the human body from the perspective of physical laws, which is an integral part of preparation for professional medical activity.

In the context of rapidly developing technologies and the introduction of innovative methods of diagnosis and treatment, future doctors need not only theoretical knowledge but also practical skills in applying biophysical methods to solve real medical tasks. Therefore, training students to solve professional tasks in biophysics becomes an important aspect of the educational process.

The aim of this study is to analyze the state of the problem of training medical students to solve professional tasks in the teaching of biophysics. We will examine how modern teaching methods, including the use of information technologies and innovative pedagogical approaches, contribute to effective material assimilation and the development of practical skills in students, and how this knowledge assists them in professional medical activities.

Literature Review and Method

The study of biophysics in a medical university contributes to the formation of a scientific outlook on the living organism and the processes occurring in it as an integrated system. It allows students to consider the physicochemical nature of life phenomena, equips future doctors with knowledge of modern physical and biophysical methods of diagnosis and treatment of patients, and the principles of the devices and equipment that are essentially physical instruments.

Particular importance is attached to the training of future doctors to solve professional tasks during the teaching of physics in medical universities. Professional tasks, for which students must be prepared during biophysics education in medical universities, are understood as tasks related to preventive, diagnostic, and therapeutic activities. Since biophysics is a prerequisite for studying a number of specialized disciplines, it has integrative connections with medical-biological disciplines (physiology, anatomy, histology), and its study can significantly contribute to the preparation of future doctors to solve professional tasks in preventive, diagnostic, and therapeutic activities. The relevance of the problem of preparing future doctors to solve professional tasks when studying biophysics is confirmed by the analysis of many experiments, which showed insufficient awareness among medical students of the role of biophysics in their future professional activities and the resolution of professional tasks based on the application of physical knowledge and skills.

The issues of studying biophysics by future specialists in the medical field have been discussed in a number of studies.

However, the problem of preparing students in medical universities to solve professional tasks in the teaching of biophysics, especially in the context of integrating physics with medical-biological disciplines, remains relevant.

In studying biophysics in a medical university, it is necessary and possible to prepare students to solve professional tasks in the context of integrating biophysics with medical-biological disciplines (anatomy, physiology, histology) by forming the professional integrative skills of future doctors to solve professional tasks based on physical knowledge and skills in unity with mastering the fundamentals of biophysics.

The following tasks need to be specified:

a) professional-oriented biophysical tasks as a special tool for developing medical students' ability to solve professional tasks based on biophysical knowledge and skills,

b) forms and methods of contextual learning as the basic forms and methods of preparing medical students to solve professional tasks in the context of integrating biophysics with medical-biological disciplines in medical universities.

The distinguishing features of the methodology for preparing future medical specialists include: the unity of fundamental (basic physical concepts, laws, theories) and professionally-oriented (medical physics, biophysics, elements of medical-biological disciplines) components of biophysics in medical universities, considering the integrative links between biophysics, physiology, and anatomy, and their use in all types of biophysics classes; preference for applying forms and methods of contextual learning, student-centered teaching technologies aimed at activating the creative aspect of future doctors' activities; recognition of the leading role of professional-oriented biophysical tasks as a special tool for developing future doctors' professional integrative skills to solve professional tasks based on physical knowledge and skills; conducting diagnostics of the students' readiness to solve professional tasks in physics during the educational process in medical universities, combined with reflexive activities using technological cards during practical training in healthcare institutions, revealing the students' awareness of applying physical knowledge and skills to solve professional tasks.

There are the following stages in the methodology for preparing medical students to solve professional tasks:

1. theoretical stage of preparation within the framework of the physical component of the basic discipline "biophysics",

2. practical stage of preparation within the framework of educational practice in healthcare institutions,

3. theoretical stage of preparation within the framework of the physical component of the variable discipline "biophysics".

The development of teaching methods for biophysics can be carried out in the areas of developing personal qualities of future doctors in the process of their preparation to solve professional tasks when studying biophysics in medical universities in the context of integrating physics with medical-biological disciplines.

Conclusion

Thus, the training of medical students, especially students of the Department of Biomedical Engineering, to solve professional tasks in the teaching of biophysics is an integral part of their general education and professional preparation. Biophysics provides essential knowledge and skills necessary for successful medical practice, as it allows medical specialists to understand and apply physical principles in biological processes and medical technologies.

The effectiveness of training in this field largely depends on the use of innovative methods and information technologies, as well as the application of interdisciplinary approaches that contribute to a deeper understanding of the material and the development of practical knowledge. It is important for educational programs to continue adapting to the modern requirements of medicine and technology, and for instructors to find optimal ways to integrate theoretical and practical knowledge to enhance the qualifications of future specialists. Therefore, the successful training of medical students in the field of biophysics directly influences their ability to solve professional tasks, which in turn contributes to the improvement of the quality of medical care and the implementation of new technologies in clinical practice.

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