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Improving the System of Interdisciplinary Integration of the Medical Education Process Taking into Account the Elements of Education in the Teaching of Clinical Sciences

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ABSTRACT

The results of the study made it possible to improve the system of interdisciplinary integration of the medical education process, considering the vertical and horizontal integration of educational programs in the teaching of clinical sciences, the ergonomic requirements of the educational trajectory and the creation of a system and educational elements. As a result of organizing the educational process considering the credit-module system, the national mentality of the region, and the age characteristics of students, future doctors will be able to synthesize and improve the quality of knowledge, deepen clinical thinking, form an integrated approach to the sciences being studied, and develop scientific and practical potential. The introduction of pedagogical technologies based on integrative and targeted modular competence in the teaching of clinical sciences makes it possible to increase the activity of students in the learning process and the rates of mastering theoretical and practical knowledge on average from 29.1% to 90.7%. In the credit-module system, which includes the process of teaching urology, the total weekly load (excluding the audience) is set at 54 hours, self-study – at 22 hours, i.e., 40% (in foreign countries this figure is 60-70 hours), which, in turn, indicates the need to increase the hours of independent work of students (by at least 50%) in the process of medical education, as well as the formation of target assignments based on foreign experience, the need to individually rework the topics of the educational process not only in form but also in content. Based on an innovative approach, the development of a program for the prevention, accurate detection, and treatment of diseases in the population, which allows increasing the student's scientific curiosity, and its application during the student's practice has a positive effect on increasing the student's interest in his profession.

Keywords: medicine, higher education institutions, credit-module system, innovative education.

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In the training of specialists in the field of medicine, it is very important to acquire theoretical knowledge and practical skills, as well as the ability to search in the scientific field. The implementation of innovative educational technologies has a unique effect on the training of competitive specialists in the healthcare system, requiring educators to constantly use modern technologies and activate the independent learning process.

Today, teaching methodology, like didactics, is going through a difficult period. Currently, the goals of higher medical education have changed, new curricula are being developed, and new concepts of education are being created based on new approaches to reflect the content not through separate subjects, but through integrated educational directions [1, 3].

It is known that the quality of education is determined by the extent to which the learner can apply his knowledge in practice. As time has shown, unfortunately, forms of passive-informative teaching of students cannot eliminate the differences between the mastery of the theoretical material of academic subjects and the level of their creative clinical thinking and the correct formation of research skills.

Today, we cannot rely only on explanatory-illustrative and reproductive methods, which are widely used in teaching practice. Renewal of education requires the use of non-traditional methods and forms of its organization, including integrative methods, which are important in the credit module system. Integration should be considered not only in terms of interdependence in subjects, but also as an integration of educational technologies, methods, and forms.

The need to transition to integrated education arises for a few objective reasons: a significant decrease in students' interest in subjects; inadequate design and development of existing programs; inconsistency, dispersion of the stages of knowledge formation among students, the development of generalized skills and competencies in them. Practice shows that, in some cases, a concept or term within individual disciplines is defined differently, which in turn complicates the educational process [4, 6].

In the study of this process, the experience, and specific positive aspects of the universities of the following foreign countries, which took high places in the QS and THE ratings, were observed.

1. Harvard University (USA)
2. University of Freiburg (Germany)
3. Koryo University (South Korea)
4. "Aladdin Keykubat" University (Turkey)
5. Vilnius and Kaussans universities (Lithuania)

6. Kazan State Medical University (Russia)

7. Asfandiyorov National Medical University (Kazakhstan)

In all studied foreign higher education institutions, the field of study is called "Medicine".

In the foreign higher education system, the bachelor's study period is 6 years, but at Harvard University, after 4 years of medicine, a targeted 4-year educational process is organized in the chosen field. European and Asian countries are divided into pre-medical and medical sciences, 2 years of pre-medical fundamental sciences and 4 years of medical sciences are taught [1, 6].

The process of medical education in foreign higher education institutions has the following features:

- social sciences are not taken into account;
- different approaches were observed in the field of languages (in some cases, the teaching of the state language was taken into account, and in others, a foreign language was taught);
- the state's level of development, orientation to current and future trending sectors;
- that subjects are formed in the form of a module, taking into account the integration between them;
- development of clinical thinking and analytical skills;
- orientation to scientific inquiry;
- special attention is paid to the process of independent education, the presence of the reconnection process;
- special attention is paid to practice;
- formation of students' skills to conduct independent scientific research [5, 6].

Scientific research is one of the important approaches in the field of medicine at Harvard University. During the development week at the beginning of the learning process, learners are provided with information on assessment, feedback, self-monitoring, learning consolidation, individual generation of learning plans. In the elementary courses, basic sciences are taught in mutual integration - biochemistry, cell biology, genetics, developmental biology and introduction to anatomy, histology, pharmacology, pathology, immunology, microbiology. Even though the first stages of education are relatively complicated, it is formed as a separate module for the sciences of protection and immunity in diseases relevant in medicine: dermatology, rheumatology, allergy / immunology. Health policy, medical and professional ethics, social medicine, clinical epidemiology/public health, etc., provide a foundation for future specialists to learn specific principles and apply important skills in providing medical care to the population in practice.

Scientific research takes the main place in the educational process. At the same time, advanced and integrated courses are important. The process of clinical and scientific experimentation is highly implemented. Pre-professional education provides students with the fundamentals of medicine, the scope of care, and the fundamentals of clinical science. Basics of communication, physical examination, clinical reasoning, and presentation skills are taught to ensure the continuity of the fundamental clinic, and a relatively large number of 14 credits are allocated. The homeostasis module is of particular importance, covering specific aspects of cardiovascular and respiratory systems, haematology, gastroenterology, kidney, endocrinology, and reproductive endocrinology. At the next stage, the integration of the sciences of human consciousness, brain and behavior, as well as neurology and psychopathology is carried out [8, 9].

During the transition to the main clinical experience, 5 credits are allocated to the areas of clinical anatomy, visualization, clinical epidemiology and medical ethics, culture, drug addiction, and human development. During the basic clinical experience, the main areas of medicine, neurology, obstetrics and gynecology, pediatrics, first aid, psychiatry, radiology, surgery are taught in depth and an average of 10 credits are given. 10-12 credits are allocated during the educational process to teach them to work independently in the Principal Clinical Experience, and conditions are created for them to participate in the research process directly in the laboratory. In 3 stages, perfected clinical and scientific experience, integrated scientific courses (AISC), advanced clinical and scientific experience, scientific project, clinical electives, intermediate internships, other advanced electives are carried out and it is possible to collect 60-65 credits. At this stage, a general OSCE is required.

At the next stage, the clinical experience acquired on the basis of scientific approach in the process of "Clinical Peak" along with integrated courses, mandatory courses are described and an average of 50-52 credits are allocated. In stages 5 and 6, a targeted practice process is established and conducted in clinics under the leadership of moderators [10, 12].

The medical education process in South Korea is based on the experience of Asian and European countries. Education at Koryo University is divided into pre-medical and medical stages. At the premedical stage (1-2 courses), basic medical biological sciences are taught - molecular biology, cell biology, medical genetics, general chemistry and laboratory work, medical statistics (theory and practice), physics, chemistry, mathematics, and a foreign language are taught.

The positive aspects of the educational process are as follows: at this stage, special attention is paid to the integration of science and technology, thinking and expression, a wide coverage of the concepts of quantitative thinking, and the possibility of practical application. At the same time, separate credits are allocated for the introduction to medical education and the theory of medical education.

Fundamental medical integrated practice allows to increase the level of preparation for practice based on the acquired knowledge and skills of the students.

3 to 8 credits are allocated to the subjects that provide the fundamental basis in 3 stages and are taught separately - biochemistry, anatomy, physiology, histology, fundamental neurology, microbiology, pathology, embryology, pharmacology. At the same time, special attention is paid to the direction of preventive medicine (clinical epidemiology) [8, 11].

And at the next level, clinical sciences namely nephrology, psychiatry, cardiology, behavioral science, clinical medicine, immunology, obstetrics and gynecology, pediatrics, infection, pulmonology, health management, musculoskeletal, neurology, clinical anatomy, gastroenterology, emergency medicine, endocrinology and on average, 1-4 credits are allocated to metabolism, hematology, oncology. One of the distinctive features of this stage is the special credit given to clinical medicine and its research and diagnostic process.

5 and 6 are internships, which include clinical medicine synthesis and clinical assessment, along with internal medicine and surgical studies (up to 2-4 credits). Of note is practical medicine, medical ethics and professionalism, and preventive medicine (environmental and industrial). At the last stage, the evaluation of the synthesis of medical theory, the evaluation of clinical medicine skills, the process of evaluation of the synthesis of fundamental medicine, volunteering and the graduation exam are held. In the stage of medical sciences (3-6), clinical sciences are mainly taught. Clinical practice is carried out in the 5th and 6th courses with a share of more than 60% of the practical process.

Based on the experience of European countries, a clear view of the credit module system has been introduced in the medical education process in Turkey. In the 1st and 2nd courses, the educational process is carried out in fundamental subjects. Introduction to basic medical sciences: medical biology [7, 9].

Medical biochemistry, biophysics, medical history and ethics, medical terminology, physiology, histology, embryology, anatomy, medical psychology, public health (up to 9 - 10 credits) as well as Turkish language, Eng-

lish (1 - 2 credits) are compulsory subjects. entered as Biostatistics and information technologies are allocated - 2 credits. To strengthen the sense of patriotism, national Turkish dances were also included in the competition subject and 2 credits were allocated. Starting from the 3rd course, a system of joint teaching of logically and clinically interrelated subjects has been introduced. In 6 courses, a full practice process has been introduced. Integrated case discussion is also one of the unique aspects of the learning process.

A few reforms have been implemented to improve the medical education process in the state of Lithuania. During the 1st and 2nd semesters, mandatory courses in medical and biological sciences are taught at Vilnius University: anatomy, biology and human genetics, histology, introduction to the medical examination process, Latin and special language, biochemistry, human psychology, basics of professional communication, 5 credits each. In the 3rd and 4th semesters, general education modules are also considered, and the basics of general microbiology, immunology, human physiology, health system, propaedeutics of internal medicine, and clinical oncology are taught. Nursing skills are also emphasized. During the 5th and 10th semesters, clinical subjects are taught and allocated an average of 5 credits. Clinical practical skills are formed as a separate discipline. In the 10th semester, family medicine is also considered. In the 11th and 12th semesters, an internship and a thesis are required [11, 12].

In Kaunas Medical University, in the 1st and 2nd semesters, health, examination methods, general skills of doctors, first aid and fundamental sciences are taught as part of the medical entrance course. Social studies are taught as an elective course. 5 semesters with special emphasis on professional competencies and clinical skills. The organization of scientific research is considered. In semesters 7 and 8, practical skills in clinical medicine are taught separately in clinical subjects. Procedures and effective communication skills are also important. Separate modules have been created since the 9th semester. Separate credits are allocated for research work and practice.

At the University of Freisburg, the 1st and 4th semesters are the pre-clinical stage, the scientific foundations of medicine, i.e., fundamental sciences, are taught, and a 3-month internship is required. 5 and 6 semesters of intensive practical courses, i.e., medical-biological, pathological, hygienic, preventive, psychological, and health sciences are taught. Clinical subjects are taught separately in the 7th and 10th semesters. In the 11th and 12th semesters, an internship is organized in a clinic. At the

end of the 2nd year, the final state certification is given for the transition to the clinical stage and at the end of the 10th semester, the transition to the internship [3, 7].

In the Russian Federation, the medical education process is divided into humanitarian, fundamental, medical-biological, and speciality courses, and in the 1st-3rd stages, mainly social, and medical-biological sciences are taught in pairs. At these stages, fundamental sciences are conducted in the form of practical training and lecture training. In the section of 4-6 courses, an average of 10-12 subjects in the fields of therapy, surgery, paediatrics, obstetrics, and gynaecology are formed in the form of cycles in the section of semesters. Particular attention is paid to the sciences of comorbid conditions. A separate practice process is organized at all stages. At the end of 6 courses, the final state certification is held.

Conclusion. It should be said that although the process of medical education in foreign countries has its own principles, the process of teaching basic and clinical sciences has an almost common approach to the organization of the educational process. In all countries, to one degree or another, an integrative approach is considered. In the United States of America, medical education is mainly based on scientific research, and in European countries, scientific-practical experience is established since a modular approach, vertical integration is taken into account, and in Korea and the Russian Federation, the educational process is distinguished by the superiority of horizontal integration between disciplines.

Continuity of theoretical knowledge, acquisition of practical skills and practical processes in higher medical educational institutions in foreign countries is provided by implementation in the auditorium - simulation training centres and in the clinic. The process of practice and scientific research is conducted under strong supervision and evaluation is fully considered.

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**KLINIK FANLARNI O'QITISHDA TA'LIM
ELEMENTLARINI E'TIBORGA OLGAN XOLDA
TIBBIYOT TA'LIMI JARAYONING FAN-
LARARO INTEGRATSIYA TIZIMINI TAKOMIL-
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АБСТРАКТ

Tadqiqot natijalari klinik fanlarni o'qitishda ta'lim dasturlarining vertikal va gorizontal integratsiyasi, ta'lim traektoriyasi hamda tizimni yaratishning ergonometrik talablari, ta'lim elementlarini e'tiborga olgan holda tibbiyot ta'limi jarayonining fanlararo integratsiya tizimini takomillashtirish imkonini berdi. Kredit modul tizimini, mintaqaning milliy mentalitetini, talabalarning yosh bilan bog'liq xususiyatlarini e'tiborga olgan holda ta'lim jarayonini tashkil etish natijasida bo'lajak shifokorlarda bilimlarni sintez qilish va sifatini oshirish, klinik fikrlashning chuqurlashishi, o'rganilayotgan fanlarga kompleks yondashuvning shakllanishi, ilmiy va amaliy salohiyatni rivojlantirish imkoniyatlari yaratiladi. Klinik fanlarni o'qitishda integratsion maqsadli modulli kompetensiyaga asoslangan pedagogik texnologiyalarini joriy qilinishi ta'lim oluvchilarning mashg'ulot davomida faolligi hamda nazariy, amaliy bilimlari bo'yicha o'zlashtirish ko'rsatkichlarining o'rtacha 29,1% dan 90,7% ga oshirish imkoni beradi. Kredit modul tizimida urologiya fanini o'qitish jarayoni o'z ichiga haftalik umumiy yuklamasi (auditoriya va auditoriyadan tashqari) hajmi 54 soat qilib belgilangan bo'lib, mustaqil ta'lim 22 soatni, ya'ni 40%ni tashkil etadi (chet davlatlarda esa bu ko'rsatkich 60-70%), bu o'z navbatida tibbiy ta'lim jarayonida talabalarning mustaqil ta'lim soatlarni oshirish (kamida 50% ga) bilan bir qatorda xorijiy tajribaga asoslangan holda maqsadli vazifalarni shakllantirish, individual tartibda ta'lim jarayoni mavzularini nafaqat shaklan balki mazmunan qayta ishlab chiqishloz-impligini ko'rsatadi. Tibbiy klinik fanlarni zamonaviy innovatsion, interfaol ta'lim usullarini qo'llagan holda o'qitishda darslarni bemor demonstratsiyasi orqali(bemorning roziligi bilan) yoki simulyatsion markazlarda olib borilganda talabalarning bilimlarini 87-95% ga, amaliy ko'nikmalarini 85-92%ga oshishi isbotlandi. Innovatsion yondoshuv asosida talabalarning ilmiy izlanuvchanligini oshirishga imkon bepuvchi hamda aholi opasida kasalliklarni oldini olish, epta aniqlash va bashopat bepish bo'yicha dasturlap ishlab chiqish va talabalarning amaliyoti davomida qo'llash ulapning o'z

kasbiga bo'lgan qiziqishining oshishiga ijobiy ta'sip ko'psatdi.

Kalit so'zlar: tibbiyot, oliy o'quv yurtlari, kredit modul tizimi, innovatsion ta'lim.

**СОВЕРШЕНСТВОВАНИЕ СИСТЕМЫ
МЕЖДИСЦИПЛИНАРНОЙ ИНТЕГРАЦИИ
ПРОЦЕССА МЕДИЦИНСКОГО
ОБРАЗОВАНИЯ С УЧЕТОМ ЭЛЕМЕНТОВ
ОБРАЗОВАНИЯ В ПРЕПОДАВАНИИ
КЛИНИЧЕСКИХ НАУК**

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АБСТРАКТ

Результаты исследования позволили усовершенствовать систему междисциплинарной интеграции процесса медицинского образования с учетом вертикальной и горизонтальной интеграции образовательных программ в преподавании клинических наук, эргонометрических требований образовательной траектории и создания системы и воспитательных элементов. В результате организации учебного процесса с учетом кредитно-модульной системы, национального менталитета региона, возрастных особенностей обучающихся будущие врачи смогут синтезировать и повышать качество знаний, углублять клиническое мышление, формировать комплексный подход к изучаемым наукам, развивать научный и практический потенциал. Внедрение педагогических технологий на основе интегративно-целевой модульной компетентности в преподавание клинических наук позволяет повысить активность студентов в процессе обучения и показатели усвоения теоретических и практических знаний в среднем с 29,1% до 90,7% . В кредитно-модульной системе, включающей процесс обучения урологии, общая недельная нагрузка (без учета аудитории) установлена в размере 54 часов, самостоятельное обучение - 22 часа, т.е. 40% (в зарубежных странах этот показатель составляет 60-70 часов). %), что, в свою очередь, свидетельствует о необходимости увеличения часов самостоятельной работы студентов (не менее чем на 50 %) в процессе медицинского образования, а также формирования целевых заданий на основе зарубежного опыта, необходимости индивидуально перерабатывать темы учебного процесса не только по форме, но

и по содержанию. При преподавании медицинских клинических наук с использованием современных инновационных, интерактивных методов обучения доказано, что знания студентов увеличиваются на 87-95%, а их практические навыки увеличиваются на 85-92% при проведении занятий посредством демонстрации пациентов. (с согласия пациента) или в симуляционных центрах. На основе инновационного подхода разработка программы по профилактике, точному выявлению и лечению заболеваний у

населения, позволяющая повысить научную любознательность студента, а ее применение в ходе практики студента положительно влияет на повышение интереса студента к своей профессии.

Ключевые слова: медицина, высшие учебные заведения, кредитно-модульная система, инновационное образование.