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SYNERGY OF PARTICIPANTS IN THE EDUCATIONAL PROCESS: ATTITUDE OF HIGHER EDUCATION STUDENTS TO THE STUDY OF PHARMACOLOGY AS A TOOL FOR DETERMINING ITS EFFECTIVENESS

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The organization of the educational process at the Department of Pharmacology of the Bogomolets National Medical University is aimed at the formation of competencies among applicants for higher medical education, the acquisition of knowledge and skills in fundamental pharmacology, which is an integral aspect of the acquisition of clinical thinking in them, their further formation as future doctors, in particular military doctors, and pediatricians.

The purpose of the study was to analyze the attitude of applicants for higher medical education to pharmacology as a fundamental biomedical discipline and to assess the effectiveness of the educational process at the Department of Pharmacology based on the results of feedback.

Materials and methods of research. During the study, the authors resorted to the methods of questionnaires, mathematical analysis, descriptive statistics, and also used general scientific theoretical methods, such as the bibliographic method, methods of information synthesis, comparison and generalization.

Students were surveyed by creating and distributing a Google form among them from May 27 to June 4, 2025 inclusive. A total of 378 respondents took part in the survey, among which 324 people were mastering the specialty 222 "Medicine" (147 students of the Medical Faculty No. 1, 135 students of the Medical Faculty No. 2 and 42 representatives of the Faculty of Doctors' Training for the Armed Forces of Ukraine), 54 respondents were future pediatricians (Medical Faculty No. 3).

Results. 266 students (70.4%) position pharmacology as an extremely important discipline, 109 respondents (28.8%) consider pharmacology important and another 3 people (0.8%) found it difficult to answer. In the context of specialties being mastered by students, among applicants for specialty 222 "Medicine", 224 respondents (59.3%) emphasized the extreme importance of pharmacology as a discipline, 97 respondents (25.7%) consider pharmacology important, 3 more students found it difficult to answer (0.8%). The answers of applicants for specialty 228 "Pediatrics" were distributed as follows: 42 people (11.1%) considered pharmacology extremely important, and the rest of the students noted that pharmacology is important – 12 people (3.2%).

Conclusions. The vast majority of applicants for higher medical education consider pharmacology to be extremely important or important (375 students – 99.2% of all respondents) discipline, which lays the foundation for the acquisition of the necessary competencies by a future doctor.



Regular monitoring and independent assessment by students of the effectiveness of individual components of the educational process is an important tool that allows us to timely identify positive and negative trends, identify problematic aspects to ensure the proper quality of medical education.

Key words: pharmacology, educational process, applicants for higher medical education, efficiency of the educational process, quality of training, Bogomolets National Medical University.

Зайченко Ганна, Дорошенко Анна, Бабак Василь, Козак Дмитро. Синергія учасників освітнього процесу: ставлення здобувачів вищої освіти до вивчення фармакології як інструмент визначення його ефективності

Організація освітнього процесу на кафедрі фармакології Національного медичного університету імені О.О. Богомольця спрямована на формування у здобувачів вищої медичної освіти компетентностей, здобуття ними знань та вмінь з фундаментальної фармакології, що є невід'ємним аспектом набуття в них клінічного мислення, їх подальшого становлення як майбутніх лікарів, зокрема військових лікарів, та педіатрів.

Метою дослідження було проаналізувати ставлення здобувачів вищої медичної освіти до фармакології, як фундаментальної біомедичної дисципліни, та оцінити ефективність освітнього процесу на кафедрі фармакології за результатами зворотного зв'язку.

Матеріали та методи дослідження. Під час проведення дослідження автори вдавалися до методів анкетування, математичного аналізу, описової статистики, а також було використано загальнонаукові теоретичні методи, такі як бібліографічний метод, методи інформаційного синтезу, порівняння та узагальнення.

Здобувачів освіти було проанкетовано шляхом розробки і розповсюдження між ними Google-форми з 27 травня до 4 червня 2025 року включно, після складання семестрового іспиту. Всього в опитуванні взяло участь 378 респондентів, серед яких 324 особи опановували спеціальність 222 «Медицина» (147 здобувачів освіти медичного факультету №1, 135 студентів медичного факультету №2 та 42 представника факультету підготовки лікарів для Збройних Сил України), 54 проанкетованих були майбутніми педіатрами (медичний факультет №3).

Результати. 266 студентів (70,4%) позиціонували фармакологію як вкрай важливу дисципліну, 109 опитаних (28,8%) визначали фармакологію важливою і ще 3 особи (0,8%) утруднилися з відповіддю. В розрізі спеціальностей, які опановували студенти, серед здобувачів спеціальності 222 «Медицина» 224 респонденти (59,3%) підкреслили надзвичайну важливість фармакології як дисципліни, 97 анкетованих (25,7 %) вважали фармакологію важливою, ще 3 студенти утруднилися з відповіддю (0,8%). Відповіді здобувачів спеціальності 228 «Педіатрія» розподілились наступним чином: 42 особи (11,1%) вважали фармакологію вкрай важливою, а решта студентів зазначили, що фармакологія є важливою – 12 осіб (3,2%).

Висновки. Переважна більшість здобувачів вищої медичної освіти вважають фармакологію вкрай важливою або важливою (375 студентів – 99,2% від всіх опитаних) дисципліною, яка закладає основу для набуття необхідних компетенцій майбутнім лікарем.

Регулярний моніторинг та незалежна оцінка здобувачами освіти ефективності окремих складових освітнього процесу є важливим інструментом, що дозволяє своєчасно визначати позитивні і негативні тренди, виявляти проблемні аспекти для забезпечення належної якості медичної освіти.

Ключові слова: фармакологія, освітній процес, здобувачі вищої медичної освіти, ефективність освітнього процесу, якість підготовки, Національний медичний університет імені О.О. Богомольця.

Introduction. The organization of the educational process at the Department of Pharmacology of the Bogomolets National Medical University is aimed at the formation of competencies in applicants for higher medical education, the acquisition of knowledge and skills in fundamental pharmacology, which is an integral aspect of the acquisition of clinical thinking in them, their further formation as future doctors, in particular military doctors, and pediatricians [1-4]. Basic pharmacology is one of the cornerstones for the study of clinical highly specialized disciplines in each of the above-mentioned specialties. Awareness of the rational, effective and safe use of medicines is an indisputable professional competence that distinguishes a highly qualified doctor who prescribes medicines to a patient [5, 6].

The priority task for any academic team is to understand the attitude of students to the disciplines taught to them, in order to develop a paradigm of

responding to the challenges that arise in connection with the development of the academic field, changes in teaching trends, the commitment of students to the study of the discipline in the context of their interest in mastering the latest trends and progressive directions in the development of medical education [7].

In order to outline the vector of further development of pharmacology as a fundamental specialized discipline, and to analyze the feedback from students, 3rd year applicants for higher education of the Bogomolets National Medical University, who studied in the specialties 222 “Medicine” (in particular, at the Faculty of Doctors’ Training for the Armed Forces of Ukraine) and 228 “Pediatrics” in the field of knowledge 22 “Healthcare”, were interviewed. Students passed a questionnaire after passing the exam in discipline “Pharmacology” in May 2025.

The purpose of the study was to analyze the attitude of applicants for higher medical education

to pharmacology as a fundamental biomedical discipline, and to assess the effectiveness of the educational process at the Department of Pharmacology based on the results of feedback.

Materials and methods of research. During the study, the authors resorted to the methods of questionnaires, mathematical analysis, descriptive statistics, and also used general scientific theoretical methods, such as the bibliographic method, methods of information synthesis, comparison and generalization.

Students were surveyed by creating and distributing a Google form between them from May 27 to June 4, 2025 inclusive. A total of 378 respondents took part in the survey, among which 324 people were mastering the specialty 222 “Medicine” (147 students of the Medical Faculty No. 1, 135 students of the Medical Faculty No. 2 and 42 representatives of the Faculty of Doctors’ Training for the Armed Forces of Ukraine), 54 respondents were future pediatricians (Medical Faculty No. 3).

The content and form of the questionnaire were discussed and approved at the methodological meeting of the Department of Pharmacology by the academic staff of the relevant structural unit of the university. Respondents were guaranteed anonymity, as

well as the absence of any external interventions that could affect the results of the questionnaire.

Microsoft 365 Excel software was involved in the processing of the questionnaire results. It should be noted that the percentage indicators of the results of the questionnaire of higher education applicants who studied in the specialty 228 “Pediatrics” were calculated relative to the total number of students from among both specialties, whose representatives were interviewed.

Results of the study and their discussion. In the course of the questionnaire, students were asked to provide answers to the questions of the questionnaire on the organization of the educational process at the Department of Pharmacology and their attitude to certain aspects of teaching the discipline “Pharmacology” for the formation of competencies of the future doctor.

In the process of analyzing the results of the survey of students, it was found that 266 students (70.4%) position pharmacology as an extremely important discipline, 109 respondents (28.8%) consider pharmacology important, and another 3 people (0.8%) found it difficult to answer (Figure 1a). In the context of specialties being mastered by students, among

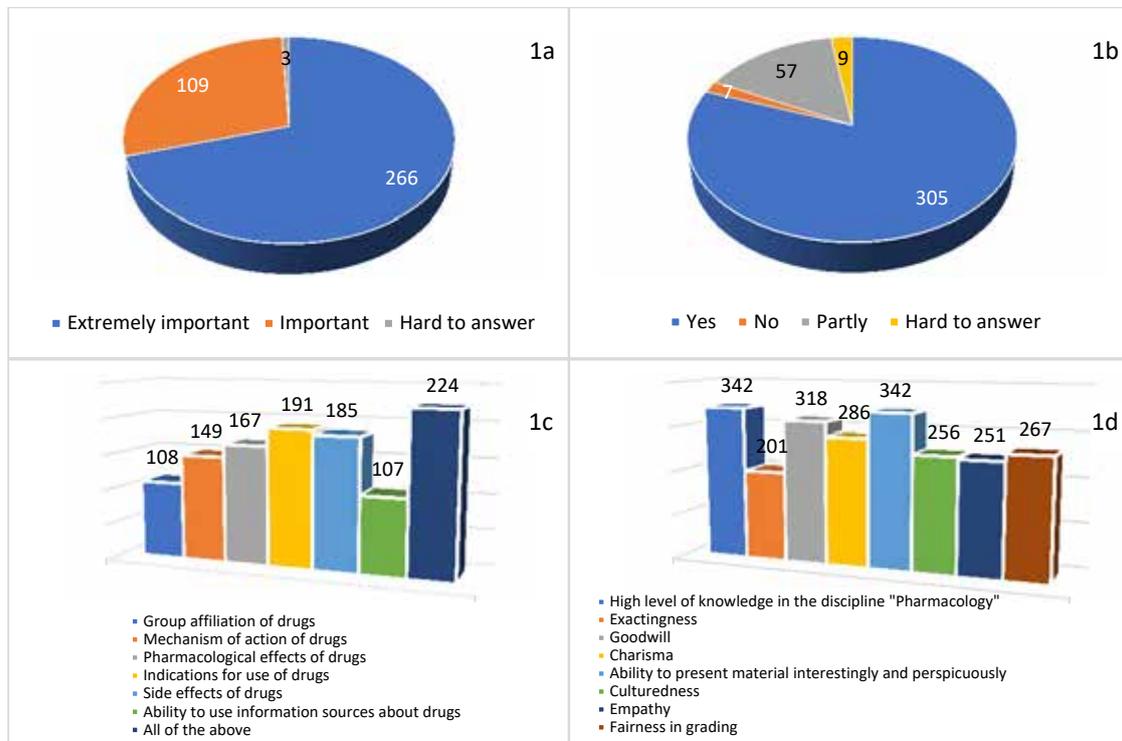


Fig. 1. The results of the questionnaire of students regarding the following criteria for evaluating the activities of the department:

1a – the importance of the discipline “Pharmacology” for the formation of the competencies of the future doctor; 1b – profiling and adaptation of practical classes in the discipline “Pharmacology”; 1c – the most important aspects of the discipline “Pharmacology” for a doctor; 1d – positive features of the teacher who conducted practical classes in the discipline “Pharmacology”

applicants for specialty 222 “Medicine”, 224 respondents (59.3%) emphasized the extreme importance of pharmacology as a discipline, 97 respondents (25.7%) consider pharmacology important, 3 more students found it difficult to answer (0.8%). The answers of applicants for specialty 228 “Pediatrics” were distributed as follows: 42 people (11.1%) considered pharmacology extremely important, and the rest of the students noted that pharmacology is important – 12 people (3.2%).

The next aspect of the survey was the intention to find out the attitudes of students to whether pharmacology classes were sufficiently profiled and adapted to their future specialization (Figure 1b). A total of 305 students (80.7%) considered classes in the above discipline to be properly profiled, 57 respondents (15.1%) rated classes in pharmacology as partially profiled, 7 respondents (1.9%) claimed that classes in pharmacology were not adapted to their specialty, another 9 survey participants (2.3%) found it difficult to answer. As for students, future doctors and military doctors, it should be noted that 259 respondents (68.5%) considered pharmacology classes to be sufficiently profiled, 49 respondents (13%) described the classes as partially adapted, another 7 respondents (1.9%) noted that the classes were not properly profiled. Another 9 respondents (2.4%) found it difficult to answer this question. Future pediatricians considered pharmacology classes as fully or partially profiled: 46 people (12.2%) emphasized that the classes were fully adapted, another 8 survey participants (2.1%) focused their attention on the fact that the classes were partially profiled.

The next stage of the questionnaire was aimed at determining the most important aspects of pharmacology according to the students (Figure 1c). Among all the respondents, 108 respondents (28.6%) positioned the group affiliation of the drug as an important aspect, 149 respondents (39.4%) noted the mechanism of action of drugs as an important component of the study of this discipline, 167 people (44.2%) drew attention to the importance of pharmacological effects of drugs, 191 students (50.5%) expressed the point of view that indications for prescribing drugs are important, 185 respondents (48.9%) emphasized the importance of adverse drug reactions, 117 respondents (31%) considered the ability to use information sources about drugs important. In addition, 224 people indicated that all aspects of pharmacology are important, this figure was 59.3%. In the context of specialties, 168 future doctors and military doctors (44.4%) singled out indications for prescribing drugs as an important aspect of this discipline, 165 respondents (43.7%) paid attention to adverse

reactions of drugs, 150 respondents (39.7%) singled out the pharmacological effects of drugs, 130 respondents (34.4%) considered the study of the mechanism of action of drugs to be key, 107 respondents (28.3%) chose the ability to use information sources about drugs as an important aspect another 96 people (25.4%) described group affiliation as an important aspect of medicines. In addition, 191 respondents (50.5%) said that all aspects of pharmacology are important. In the group of future pediatricians, 23 people (6.1%) believed that the indications for prescribing drugs are an important component of pharmacology, 20 respondents (5.3%) focused their attention on adverse drug reactions, 19 respondents (5%) confirmed the importance of the mechanism of action of drugs, 17 respondents (4.5%) highlighted the pharmacological effects of drugs as important, 12 people (3.2%) determined the important group affiliation of drugs, another 10 respondents (2.6%) emphasized the importance of the ability to use information sources about drugs. All of the above was considered important by 33 survey participants (8.7%).

Further, students were asked to identify the positive features of the teacher who conducted practical classes in them (Figure 1d). The largest number of respondents, 342 respondents (90.5%) noted a high level of knowledge in pharmacology and the ability to present the material in an interesting and accessible way with the characteristic features of their teacher, 318 respondents (84.1%) paid attention to friendliness, 286 respondents (75.7%) – to charisma, 267 students (70.6%) highlighted the fairness of the teacher in the assessment, 256 students (67.7%) responded favorably to the teacher’s culturedness, 251 people (66.4%) positively assessed his empathy, 201 survey participants (53.2%) claimed that exactingness was a distinctive feature of the teacher. 297 future doctors and military doctors (78.6%) responded favorably to the teacher’s ability to convey the material in an interesting way, 291 respondents (77%) noted the high level of knowledge of the teacher in pharmacology, 273 people (72.2%) drew attention to his friendliness, 249 people (65.9%) – to charisma, 230 respondents (60.8%) confirmed that the teacher was fair in the assessment, 220 respondents (58.2%) reacted positively to culturedness, 216 respondents (57.1%) – to the empathy of the teacher, 175 people (46.3%) confirmed that the teacher was demanding. 51 future pediatricians (13.5%) spoke favorably of the high level of knowledge of the teacher, 45 people (11.9%) noted the friendliness of the teacher and his ability to present the material in an interesting way, 37 respondents (9.8%) drew attention to the charisma and fairness in the assessment, 36 respondents

(9.5%) reacted positively to the teacher’s cultured-ness, 35 students (9.3%) claimed that the teacher was empathetic, 26 participants (6.9%) of the survey assured, that the teacher was demanding.

After that, students had the opportunity to point out the negative features of their teacher during their studies at the Department of Pharmacology (Figure 2a). 39 students (10.3%) drew attention to the meticulousness of the teacher, 22 people (5.8%) complained about the unfairness in the assessment, 11 respondents (2.9%) noticed the teacher’s inability to convey complex material, 8 respondents (2.1%) noted that the teacher was uncultured, 7 respondents (1.9%) shared the point of view about the teacher’s ill-will and indifference, 3 people (0.8%) described the level of knowledge of the teacher as low. 313 students (82.8%) did not choose any of the above options. Among future doctors and military doctors, 34 respondents (9%) noted the meticulousness of the teacher, 20 people (5.3%) drew attention to the unfairness in the assessment, 9 applicants (2.4%) confirmed the inability to convey complex material, 7 respondents (1.9%) noticed the teacher’s lack of culturedness, 6 people (1.6%) emphasized the teacher’s ill-will and indifference, 3 people (0.8%) claimed

that the level of knowledge of the teacher was low. 265 respondents (70.1%) did not note any of these negative phenomena. Among future pediatricians, 5 people (1.3%) paid attention to the meticulousness of the teacher, 2 respondents (0.5%) each claimed the inability to convey complex material and unfairness in assessment, 1 respondent (0.3%) noticed the teacher’s ill-will, indifference and unculturedness. 48 respondents (12.7%) did not choose any of the listed answer options.

In the course of the next question, students had to evaluate the course of lectures on pharmacology (Figure 2b). 221 students (58.4%) rated the course of lectures as excellent, 128 respondents (33.9%) indicated a good grade, 26 respondents (6.9%) considered the lectures satisfactory. According to 3 respondents (0.8%), the quality of lectures was unsatisfactory. 191 future doctors and military doctors (50.5%) noted the excellent quality of lectures on pharmacology, 110 respondents (29.1%) rated it well, 21 people (5.6%) noted that the quality of lectures was satisfactory, 2 respondents (0.5%) believed that the lectures were of unsatisfactory quality. 30 future pediatricians (7.9%) rated the lectures as excellent, 18 respondents (4.8%) noted the good quality of lectures, 5 people

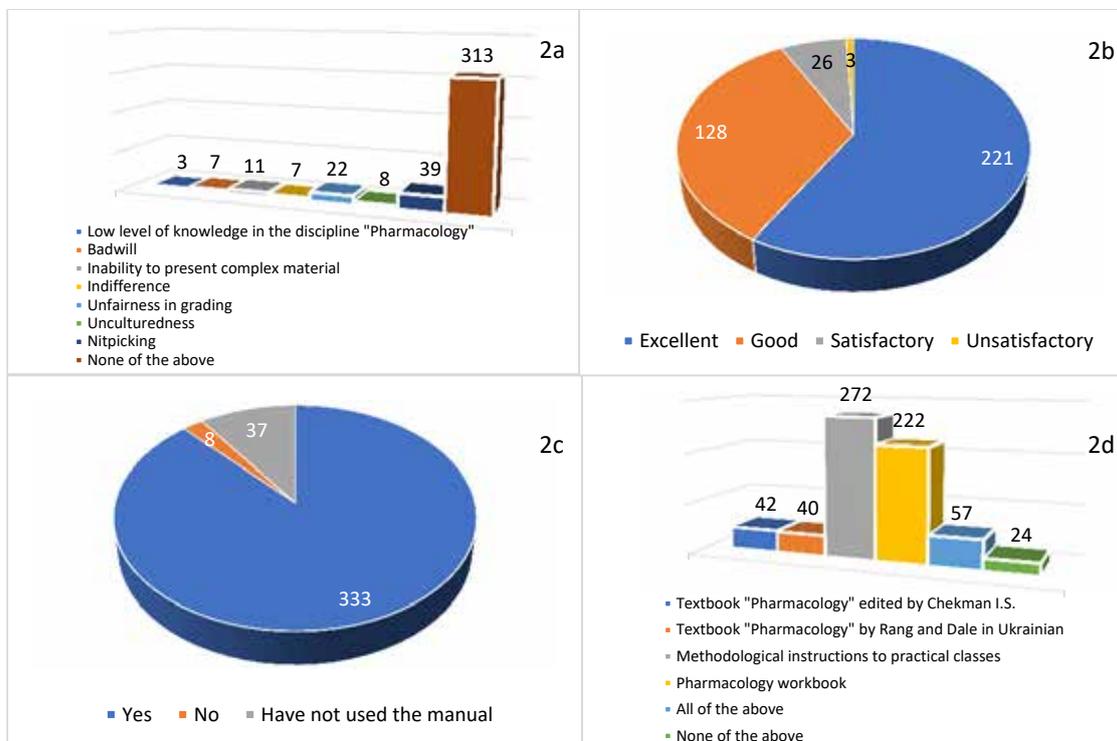


Fig. 2. The results of the questionnaire of students regarding the following criteria for evaluating the activities of the department:

2a – negative features of the teacher who conducted practical classes in the discipline “Pharmacology”; 2b – evaluation of the course of lectures in the discipline “Pharmacology” by students; 2c – the attitude of students to whether the methodological manual “STEPping together” helps them in preparing for the exam and “STEP-1”; 2d – preferences of students regarding educational materials for preparation for practical classes in the discipline “Pharmacology”

(1.3%) considered it satisfactory, only 1 respondent (0.3%) rated the lectures unsatisfactory.

After that, the students were asked whether the methodological manual “STEPping together” helps them in preparing for the exam and “KROK-1” (Figure 2c). 333 students (88.1%) noted that the methodological manual “STEPping together” was useful to them when preparing for the exam, 8 students (2.1%) did not find it useful, another 37 people (9.8%) answered that they did not use the manual. 284 future doctors and military doctors (75.1%) considered the methodological manual “STEPping together” to be one of effective means of preparing for exams, 8 people (2.1%) did not consider it such, 32 respondents (8.5%) did not use the methodological manual. 49 future pediatricians (13%) found the methodological manual “STEPping together” useful, 5 respondents (1.3%) did not use the above manual.

At the end of the survey, students were asked which methodological materials for preparing for practical classes they liked best (Figure 2d). Methodological recommendations for practical classes were chosen by 272 respondents (72%), the workbook on pharmacology corresponded to the preferences of 222 students (58.7%), the textbook “Pharmacology” edited by Chekman I.S. was indicated by 42 respondents (11.1%), the textbook “Pharmacology” by Rang and Dale in Ukrainian was indicated by 40 respondents (10.6%), all methodological materials were chosen by 57 people (15.1%), none of the methodological materials was liked by 24 respondents (6.4%). 233 future doctors and military doctors (61.6%) chose methodological recommendations for practical classes, 187 respondents (49.5%) indicated a workbook on pharmacology, 36 respondents (9.5%) indicated the textbook “Pharmacology” edited by Chekman I.S., 34 respondents (9%) chose the textbook “Pharmacology” by Rang and Dale in Ukrainian, 53 people (14%) liked all information sources, 23 respondents (6.1%) did not like any of the methodological materials. 39 future pediatricians (10.3%) chose methodological recommendations for practical classes, 35 people (9.3%) preferred the pharmacology workbook, 6 respondents (1.6%) chose the text-

book “Pharmacology” edited by Chekman I.S. and the textbook “Pharmacology” by Rang and Dale in Ukrainian, 4 respondents (1.1%) preferred all available methodological materials, and only 1 person (0.3%) did not like any of the information sources.

Conclusions:

1. The vast majority of applicants for higher medical education consider pharmacology to be extremely important or important (375 students – 99.2% of all respondents) discipline that lays the foundation for future doctors to acquire the necessary competencies in the prevention and treatment of diseases.

2. The most important aspects of the study of pharmacology, according to applicants for higher medical education, are indications for prescription (191 students (50.5%)), adverse reactions (185 respondents (48.9%)) and pharmacological effects (167 people (44.2%)) of medicines. At the same time, 224 respondents (59.3%) confirmed the importance of all aspects of pharmacology without exception.

3. A significant share of students (349 respondents – 92.3%) highly appreciated the quality and profiling of the chosen specialty, the content of lectures and practical classes in pharmacology. The vast majority of respondents positively characterized the professional profile of teachers, but the share of students (97 respondents – 25.7%) noted that their mentors have qualities that need to be improved.

4. According to 88% of students, the introduction into the educational process and regular updating of the content of the educational and methodological complex, in particular the textbook “STEPping together”, has a positive effect on the results of passing the semester exam in pharmacology by applicants for higher medical education, and subsequently on the indicator of passing the Unified State Qualification Exam “STEP-1”.

5. Regular monitoring and independent assessment by students of the effectiveness of individual components of the educational process is an important tool that allows us to timely identify positive and negative trends, identify problematic aspects to ensure the proper quality of medical education.

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