AHEAD OF PRINT

Quality of education and mental health of pharmacy students in Poland

Dorota Bęben[1,A–D], Monika Birska[1,A–D], Łukasz Gądek[1,A–D], Dominik Marciniak[2,C], Katarzyna Karłowicz-Bodalska[2,E,F]

[1] student, Faculty of Pharmacy, Wroclaw Medical University, Poland
[2] Department of Drugs Form Technology, Faculty of Pharmacy, Wroclaw Medical University, Poland

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation;
D – writing the article; E – critical revision of the article; F – final approval of the article

Advances in Clinical and Experimental Medicine, ISSN 1899–5276 (print), ISSN 2451–2680 (online) *Adv Clin Exp Med*. 2025

Address for correspondence
Monika Birska
E-mail: monika.birska@student.umw.edu.pl

Funding sources
None declared

Conflict of interest
None declared

Received on February 26, 2024
Reviewed on April 29, 2024
Accepted on May 23, 2024

Published online on September 9, 2024

Abstract

Background. Pharmacists in the healthcare system play an important role in providing safe, optimal pharmacotherapy and patient education. During their studies, in which they acquire the competencies to fulfill the pharmacist's future tasks, pharmacy students are exposed to significant stress and pressure.

Objectives. This study aims to demonstrate the extent to which the unique demands and obstacles of Polish pharmacy schools contribute to the deterioration of students' mental health and overall wellbeing.

Materials and methods. A cross-sectional study of 420 pharmacy students in Poland evaluates the quality of education at Polish universities and presents the impact of studying on students' mental health. The criteria for choosing the field of study, the particular major, the university itself, the quality of education, the academic work, and their impact on students' wellbeing were evaluated. The evaluation of the quality of education was influenced by mentoring and tutoring at the university. Pearson's χ^2 test and principal component analysis (PCA) were used in the statistical analyses.

Results. Unequal treatment of pharmacy students relative to students in other areas of medical study was marked by 90.2% of respondents, and opportunities for scientific development were indicated as good by 60.0% of pharmacy students. It was shown that 82.1% of the students rated studying as very stressful; the level of test difficulty and exams, as well as an inadequate level of knowledge imparted during classes contributed to this response. According to 75.2% of the respondents, the perceived stress had long-term effects in the form of anxiety and depression, with the need for pharmacotherapy.

Conclusions. It was shown that studies contributed to the onset and/or exacerbation of depressive and anxiety symptoms. The results indicate the need to support psychological care and extend it to to pharmacy students.

Key words: mental health, depression, education, pharmacy

Cite as
Bęben D, Birska M, Gądek Ł, Marciniak D, Karłowicz-Bodalska K. Quality of education and mental health of pharmacy students in Poland [published online as ahead of print on September 9, 2024]. *Adv Clin Exp Med*. 2025. doi:10.17219/acem/189228

DOI
10.17219/acem/189228

Background

Universities are an integral part of social development. They prepare the next generations to practice their profession and to benefit society.[1] Pharmaceutical science, one of the pillars of healthcare, is an exceptionally challenging field. The work of a pharmacist carries a responsibility that falls on the students as soon as they graduate. Medical studies are characterized by high level of stress, lots of study material and strong competition. It is not uncommon for students to be discriminated against, harassed or bullied; these might be perceived as a motivational approach for students to work more efficiently, but in practice, they often lead to demotivation and significant deterioration of mental health.[2,3] This carries long-term consequences not only for those directly affected but also for society. It makes it difficult and sometimes even impossible for students to function on a daily basis, and being forced to perform under severe stress obstructs their path to graduation and employment, which can contribute to a continuing decline in the number of people in the profession.[4]

Poland, among other countries, is struggling with the deterioration of students' mental health, especially those who have undertaken difficult and demanding studies. Anxiety disorders, depressive illnesses and other mental health issues are becoming increasingly common in the modern world.[5,6] Mental disorders represent 5 of the top 10 causes of disability. Their total treatment cost across Europe is estimated at more than 600 billion €.[7] This poses a problem for the national economy, which was exacerbated during the COVID-19 pandemic. At that time, exposure to various stress factors was increased due to uncertainty and health concerns.[8] The quarantines resulted in a lack of human interaction, thus leading to loneliness.[9] Additionally, remote learning in academic education worsened the problem of social isolation. The post-pandemic world has greatly changed. Digitalization has resulted in the weakening of social relationships and a decline in bonds within peer groups as a result of reduced opportunities for conversation during classes.[10]

Objectives

The aim of this study is to demonstrate to what extent pharmacy education in Poland, with its specific challenges and demands, contributes to the deterioration of students' mental health and wellbeing.

These findings are relevant not only to academic communities and other educational institutions but also to healthcare providers and students who are facing the problem of choosing their academic studies and career paths. Learning about the causes of the clinical problem of mental illness among the study group can contribute to more effective prevention of these disorders.

Materials and methods

Study design, setting and participants

A cross-sectional study assessing overall satisfaction with the quality of pharmacy student education in Poland and its impact on mental health was carried out.

The questionnaire consisted of 58 closed-ended multiple-choice single-answer questions. Our target group consisted of students and graduates of Polish universities (Table 1) who were studying or had completed a degree in pharmacy.

Students were required to complete an online survey using Google Forms in order to gather data. Universities and social networks were used to find study participants. Data were gathered between May 6 and July 6, 2023. A total of 420 students were included in the study, with 353 women (84.05%) and 67 men (15.95%). The study's participants were made aware that participation was optional and that responses would be kept confidential. Table 2 displays the study group's characteristics. Microsoft Excel (Microsoft Corp., Armonk, USA) was used to transfer responses from Google Forms (Google LLC, Mountain View, USA).

Table 1. Number of surveyed pharmacy students from each university

University	Number of respondents
Wroclaw Medical University	121
Medical University of Lodz	45
Poznan University of Medical Sciences	32
Pomeranian Medical University	21
Medical University of Silesia	56
Medical University of Bialystok	34
Medical University of Lublin	24
Collegium Medicum in Bydgoszcz	13
Medical University of Gdańsk	10
Jagiellonian University Medical College	13
Medical University of Warsaw	28
University of Opole	23

Table 2. Characteristics of the students group

Sex	Men	Women
Number of participants	67	353
Participants aged 18–25	51	277
Participants aged 26–30	14	58
Participants aged 30+	2	18
Students	47	254
Graduates	20	99

Variables

The data collected were divided into 3 main sections: "Introductory questions," "Study specifics and quality

of education" and "Mental health and academic issues." The "Introductory questions" section included information regarding the participant's age, sex, the university they took/had taken the pharmacy course at, and their current student status. The "Study specifics and quality of education" section contained inquiries about the main reason for choosing the particular university, the quality of education provided by the university, and the academic teachers. It also included information about the teachers' encouragement to ask questions, their attitude, their constructive evaluations of students' work, and the possibility of academic discussion with students, among other things. Participants were also asked if teachers established friendly contact with their students and contributed to the potential amicable atmosphere during classes. Questions regarding the defined grading criteria and fair grading process, along with adherence to the grading rules and standards, were also included. Participants' awareness of mentoring and tutoring opportunities at the university was examined as well. They were asked about the possibilities for scientific development and pursuing that career path at the university, their overall satisfaction with their chosen university, and whether they would recommend it to others.

The "Mental health and academic issues" section included questions regarding the amount of stress students faced before tests, exams and on a daily basis, as well as its consequences as a potentially harmful factor affecting their mental health. Attention was also drawn to the occurrence of depressive episodes and anxiety disorders, taking into account potential favoritism among teachers, harassment in verbal and non-verbal forms, sexist and chauvinistic comments, and acts of physical and psychological violence upon students. Access to psychological help offered by the university and respect for students' rights were also assessed. Participants were additionally asked about their amount of free time and whether pharmacy is equally treated and perceived by the academic authorities relative to other university courses.

Statistical analyses

Nominal scales, including dichotomous scales, were used for the variables subjected to statistical analysis. Pearson's non-parametric χ^2 test and principal component analysis (PCA), which is a method of visualizing the results for multiple comparisons of any variable to any variable and is based on the reduction of dimensions to a 2-dimensional scale – served as the basis for determining the statistical significance of the relationship between the analyzed variables. All variables in these analyses are treated the same and can, therefore, be used as dependent variables.

Regardless of the scale, PCA was used to assess overall correlations between the main study variables. It can be used to identify non-obvious and difficult-to-predict relationships between study variables with different scales of measurement. The Nonlinear Iterative Partial Least Squares (NIPALS) iterative technique was used to estimate the generated PCA model. The maximum number of iterations was set at 1,000, and the convergence threshold was set at 0.0001. The maximum predictive power of Q2 was calculated using the V-fold cross-validation method, assuming V_max = 7, and the number of components was calculated.

The results are presented in a graph (Fig. 1), along with information on the statistical significance of each component's contribution to the total percentage of explained variance and the reduction of the ideal PCA model to just 2 main components (PC 1 and PC 2).

A significance threshold of 0.05 was used in all statistical calculations. Statistica v. 13.3 PL (StatSoft Polska, Cracow, Poland) software was used to conduct the statistical tests and generate the presented graphs.

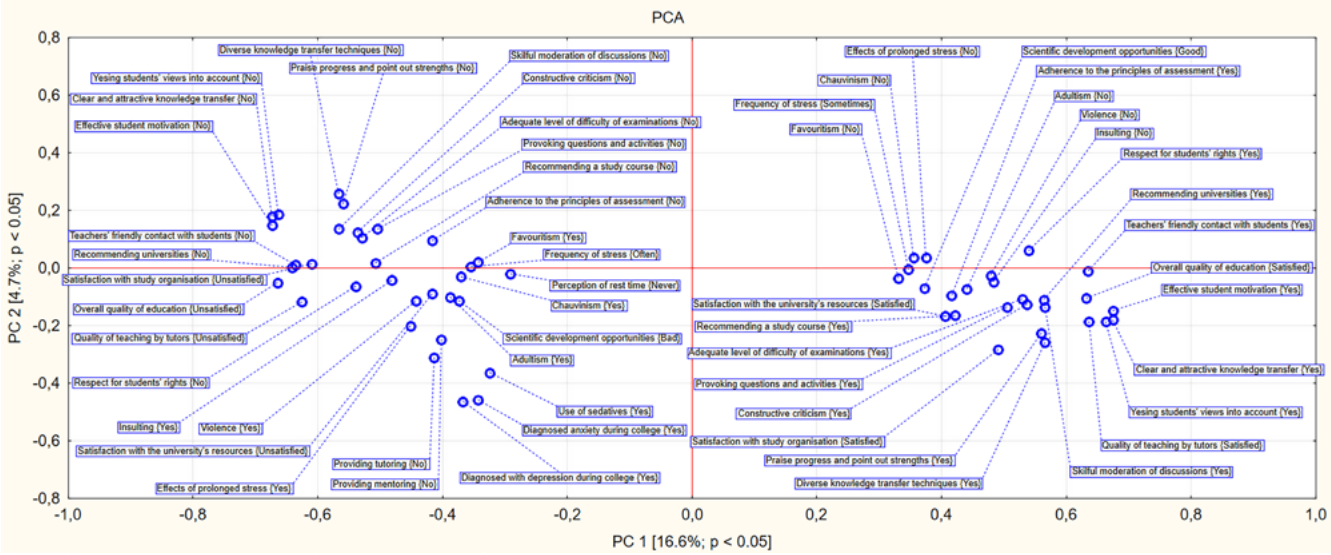

Fig. 1. The principal component analysis (PCA)

Results

Criteria for choosing the course and a university

Choosing pharmacy as a field of study was declared by 38.6% of respondents, with the reasoning that they wanted to work in a health-related field. For 18.6%, it was a second-choice due to not being accepted to their dream areas of study; for 16.7%, the criterion was finding employment after completing their education, and 16.0% said that pharmacy had always been their dream. In contrast, only 6.4% of respondents said that it was family, friends or the prestige of the profession that made them choose this field of study. The remaining 3.7% chose this major because of their desire to help others. When choosing a college, as many as 77.6% of respondents were guided by location, 11.0% said their choice was random, 7.1% said by rankings, and 4.3% said by advice from parents and/or friends.

Evaluation of education quality according to surveyed students

The survey showed that 36.4% of respondents were dissatisfied with the quality of education at pharmaceutical faculties, 34.1% were satisfied and the remaining 29.5% had no opinion. The correspondence analysis showed that students at the University of Opole were the most satisfied, while students at the Silesian Medical University in Sosnowiec were the least satisfied. Students' evaluation of their satisfaction with the quality of education at each university is shown in Fig. 2. The evaluation of the quality of education was influenced by mentoring ($p = 0.0008$, degrees of freedom (df) = 4) and tutoring ($p < 0.0001$, df = 4) at the university. When asked whether mentoring (a partnership between an academic teacher and a student to discover and develop a student's potential) was practiced at their university, respondents answered 5.0% in the affirmative, 48.6% in the negative and 46.4% had no knowledge of the subject. Only 2.14% of respondents had used mentoring opportunities at the university. It is worth noting that 53.81% said they were willing to use mentor support.

A similar relationship could be observed for tutoring (long-term, systematic and individual work, the purpose of which is to support the student in his development in accordance with his interests, aptitudes and abilities). When asked whether tutoring is conducted at their university, respondents answered 5.48% in the affirmative, 46.43% in the negative and 48.09% of them did not know. Only 3.33% of respondents used tutoring at the university, while 96.67% did not. A total of 50.95% of respondents would like to use the support of a tutor, 36.67% of respondents did not know about such an opportunity and 12.38% did not want to do so.

When asked whether the level of difficulty of tests and exams is adequate to the level of knowledge imparted in classes, as many as 53.6% of respondents answered negatively. Opportunities to gain practical experience in the field of pharmacy were negatively evaluated by 42.1% of respondents, positively by 26.4% and 31.4% gave a neutral answer, which could have an impact on the opinions and recommendation of the university ($p < 0.0001$, df = 4), as well as the faculty ($p < 0.0001$, df = 4), to future candidates. The majority of respondents (76.7%) believed that the pharmaceutical major is not treated equally compared to other majors at the medical school, which, according to 90.2% of respondents, declared it was associated with comparatively fewer privileges ($p = 0.0035$, df = 2), such as the ability to make up absences from classes.

In the evaluation of opportunities for scientific development at the university, for conducting research and for activities in student research groups, 60.0% said these opportunities were good, 18.3% said they were bad and 21.7% had no opinion. Assessment of student satisfaction with the overall organization and structure of the university

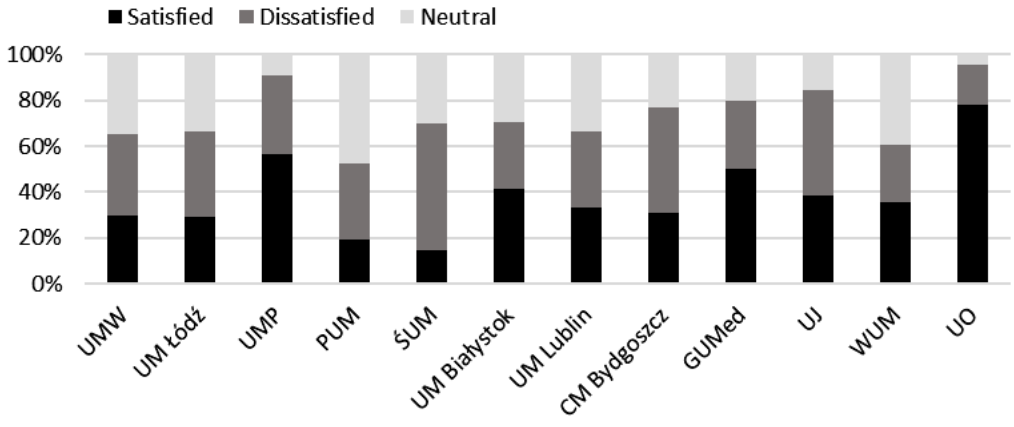

Fig. 2. The level of satisfaction with the overall quality of teaching at specific universities in Poland.

UMW – Wroclaw Medical University; UM Łódź – Medical University of Lodz; UMP – Poznan University of Medical Sciences; PUM – Pomeranian Medical University; ŚUM – Medical University of Silesia; UM – Białystok Medical University of Bialystok; UM – Lublin Medical University of Lublin; CM Bydgoszcz – Collegium Medicum in Bydgoszcz; GUMed – Medical University of Gdańsk; UJ – Jagiellonian University Medical College; WUM – Medical University of Warsaw; UO – University of Opole

showed that 55.7% of respondents were dissatisfied, 16.2% were satisfied and 28.1% declared neutral attitude. Among the factors negatively influencing this, respondents indicated, among other things, that students are belittled ($p < 0.0001$, df = 4), that pharmacy students are treated unequally to other medical majors ($p < 0.0001$, df = 4) and that students' rights are not respected ($p < 0.0001$, df = 2). A total of 78.8% of respondents felt that students' rights were respected, while 21.2% felt that they were not taken into account, which resulted in them not recommending to others their university ($p < 0.0001$, df = 2) or the pharmacy major they were studying ($p < 0.0001$, df = 2). Respondents whose rights were respected were less likely to experience long-term negative effects of stress ($p = 0.0016$, df = 1), to use tranquilizers ($p = 0.0029$, df = 1), and to experience depression ($p < 0.0001$, df = 1) and anxiety ($p = 0.0006$, df = 1).

A total of 50.0% of the respondents declared that they would not recommend the field of study to others, justifying this, among other things, by high stress ($p < 0.0001$, df = 4) and insufficient free time ($p = 0.0002$, df = 4), and also that they were ignored by the teaching staff due to their "lack of experience" both in life and work ($p = 0.0003$, df = 4) or due to the unequal treatment of pharmacy students relative to other medical school students ($p = 0.0014$, df = 4).

Students' opinion of academic teachers

Only 32.9% of the students surveyed said that academics effectively motivated them to work, while as many as 67.1% believed that they were ineffective in this regard. The effectiveness of motivating students to work was related to the year of study they were in ($p = 0.0371$, df = 5). Students in higher years felt less motivated compared to students in lower years, who experienced more effective motivation. The vast majority, representing 84.5% of respondents, answered that grading rules are consistently followed at the university. Praising progress and pointing out strengths by academics was reported by only 17.2% of respondents, while the vast majority of 82.8% said the opposite. Questions were provoked and activity encouraged according to 47.8% of respondents, 52.2% did not share this opinion and 64.3% of respondents felt that they were not listened to, while 35.7% indicated that their opinions were taken into account. In the case of the majority of respondents, 74.3% of faculty did not use varied techniques to impart knowledge. Comprehensible and attractive transfer of knowledge took place for 40.2% of respondents, while 59.8% rated the didactic process as unstructured and unattractive to receive.

According to 68.6% of the students, the academic staff did not moderate the group discussion well. This translated into opinions regarding opportunities for scientific development at the university ($p = 0.0222$, df = 2). A correlation was observed between the opportunities for scientific development perceived by students and the quality of discussion skills demonstrated by academic teachers. Overall, 47.9% of respondents declared that academics pointed out mistakes and addressed them using constructive criticism, while 52.1% did not share this position. The majority of respondents (64.3%) answered that academics established friendly contact with students. The survey found that the universities with the highest level of friendly contact with students were the University of Opole and the Warsaw Medical University, with Medical University of Silesia being the least friendly.

The majority of respondents (65.0%) experienced the phenomenon of some students being favored by university staff. Ignoring students' opinions due to their "inexperience" both in life and work was reported by 36.9% of respondents. As many as 60.5% of students experienced insults during classes. Slightly fewer, 56.2% of respondents, reported chauvinistic/sexist remarks from instructors. Some students, accounting for 29.8%, witnessed physical/psychological violence by academics during class. According to 84.6% of respondents, this occurred sometimes, and according to 15.4%, often.

When asked whether surveys evaluating academics are conducted at their university, 96.7% of respondents answered affirmatively. The survey showed that 27.6% of students do not fill them out; within this group, 32.7% of respondents explained their decision as due to the belief that their opinion does not count and will not change anything, 28.2% of respondents feared the consequences of giving a negative evaluation, and 28.2% of respondents forgot to fill out the survey. In contrast, 12.0% said it was too time-consuming. Students' opinions on the actions of university teachers are shown in Fig. 3.

Differences in the treatment of students of different sexes

Survey data showed that academics' willingness to establish friendly contact with students depended on the sex of the student ($p = 0.0275$, df = 1). More friendly attitudes were experienced by men. The level of stress ($p = 0.0017$, df = 2), experiencing its long-term effects ($p = 0.0003$, df = 2) and taking tranquilizers ($p = 0.001$, df = 1) were also dependent on sex. It was shown that women were more prone to stress. A relationship was also shown for the incidence of depression ($p = 0.0253$, df = 1), anxiety ($p = 0.0006$, df = 1) and exacerbation of symptoms of both disorders during the course of the study ($p = 0.0026$, df = 2). More women than men reported mood-related health problems. In addition, the declared amount of leisure time was dependent on the sex of the respondents ($p = 0.0173$, df = 2). Women experienced less leisure time during their studies than men. The effect of respondents' sex on their mental wellbeing was examined during the meta-analysis and is shown in Fig. 4.

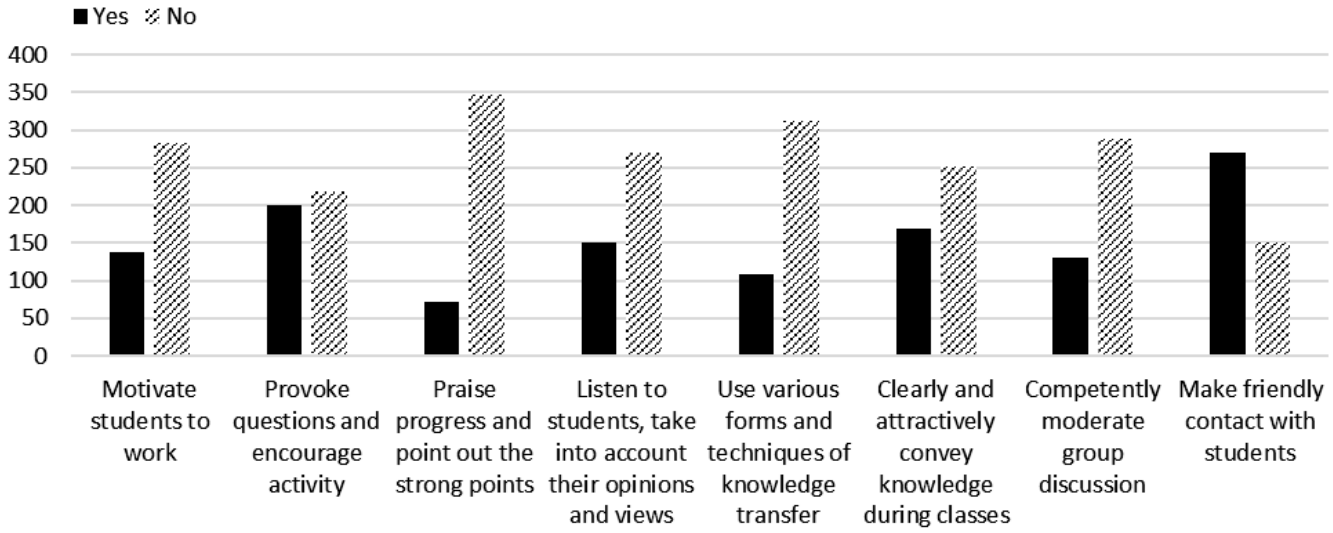

Fig. 3. Students' opinions on the actions taken by academicians

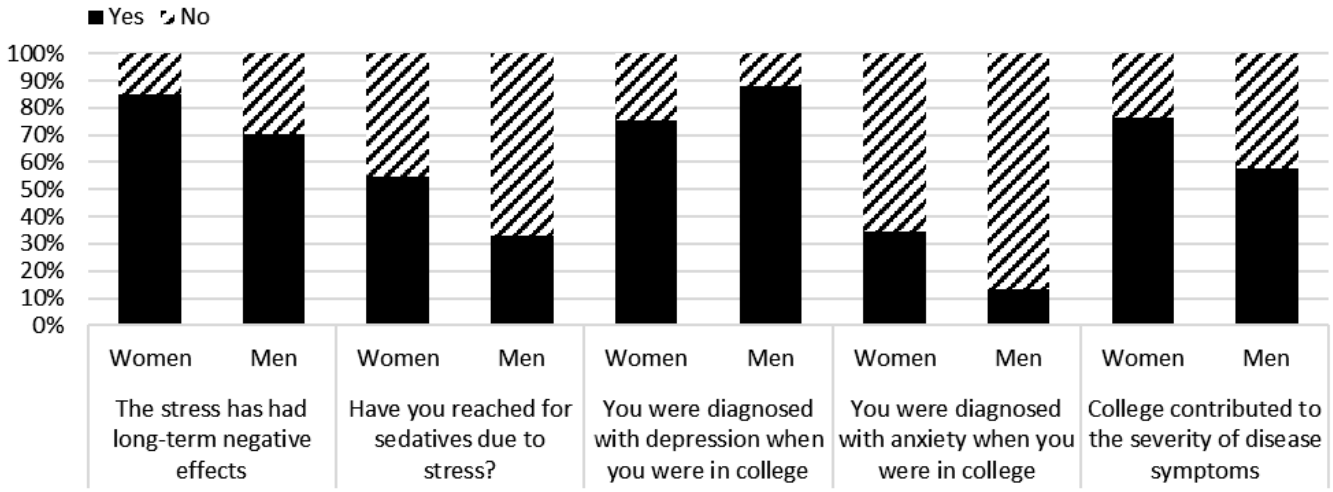

Fig. 4. Impact of sex on mental state

The impact of the teaching process on students' mental health

When asked how often they felt stressed because of classes and program requirements, 82.1% answered often, 16.7% answered sometimes and 1.2% answered never. One of the factors contributing to the level of perceived stress was the incongruency of test and exam difficulty relative to the level of knowledge imparted in class ($p < 0.0001$, $df = 1$). This phenomenon significantly contributed to the occurrence of anxiety ($p = 0.0068$, $df = 1$), depression ($p = 0.0125$, $df = 1$) as well as taking tranquilizers ($p = 0.0020$, $df = 1$). According to 75.2% of respondents, the perceived stress had long-term effects on them; for 15.7%, it had no long-term consequences and 9.1% had no opinion on the matter. The long-term consequences of perceived stress manifested themselves in anxiety ($p < 0.0001$, $df = 2$), as well as exacerbation of these symptoms ($p < 0.0001$, $df = 4$) and the need to take sedatives ($p < 0.0001$, $df = 2$). Also contributing to this phenomenon were insults to students by academics ($p = 0.0011$, $df = 4$), chauvinism ($p = 0.0339$, $df = 4$) and ignoring of student opinions due to "lack of experience" ($p = 0.0017$, $df = 4$). When asked if they were forced to turn to tranquilizers due to the stress of studying, 51.2% of the participants said yes, while 48.8% denied it. This was directly related to the previously mentioned stress, lack of free time and the overload of didactic content ($p = 0.0004$, $df = 2$). It was found that 22.4% of the students were diagnosed with depression during their studies and 31.2% with anxiety.

According to the respondents, the incidence of psychological and physical violence ($p = 0.0007$, $df = 2$), discrediting and belittling of students ($p = 0.0219$, $df = 2$), chauvinism ($p = 0.0388$, $df = 2$), as well as favoritism towards individual students ($p = 0.0024$, $df = 2$) were the main reasons for depression in students. Insulting students ($p = 0.0188$, $df = 2$) and psychological/physical violence by academics ($p = 0.0141$, $df = 2$) were shown to be the main contributors to the aforementioned conditions.

When asked about the impact of studying on exacerbation of the previously mentioned disorder symptoms, 22.5% of respondents answered negatively and 13.0% were unable to determine this. For 64.5% of respondents, studying led to an exacerbation of depressive and anxiety symptoms, which was significantly influenced by lack of free time to pursue activities outside of studying ($p = 0.0056$, $df = 4$), favoritism of students by university staff ($p = 0.0013$, $df = 4$), ignoring their opinions due to "lack of experience" ($p = 0.0031$, $df = 4$), the phenomenon of belittling ($p = 0.0076$, $df = 4$), chauvinism ($p = 0.0030$, $df = 4$), and physical as well as psychological violence during classes ($p < 0.0001$, $df = 4$). Only 15.5% of respondents said they often have plenty of free time to carry out activities outside of teaching, 70.5% said they sometimes find time and 14.0% responded never.

Assessment of the students' knowledge of the possibility of psychological help showed that 35.2% did not know about it, 58.3% were aware that they had access to such help and 6.5% claimed that they did not have it. Among the students who had access to psychological assistance, only 7.6% of the respondents used it.

Career path

The surveyed students had various plans for career path development. The largest group of respondents, accounting for 39.5%, were students who planned to start working in a community pharmacy after graduation; 15.2% said they would work in the pharmaceutical industry, 13.8% in the field of clinical research, 5.7% abroad in the pharmaceutical industry, 3.8% at university, and 3.4% planned to start working outside the field. Those with no specific plans accounted for 18.6% of respondents.

Of the surveyed pharmacy graduates, 83.7% were working in the profession. Among them, 76.2% worked in a community pharmacy, 16.2% in the pharmaceutical industry, 3.8% in a hospital pharmacy, 2.9% did research and teaching work at a university, and 1.0% found employment in a clinical pharmacy.

Discussion

In recent years, there has been an alarming global increase in the prevalence of mental health problems, regardless of age, occupation and socioeconomic status. This growing trend prompted the study and analysis of the academic communities training future pharmacists in Poland. This is important because mental health issues affect not only private but also professional life.

The aim of this study was to assess the mental health of pharmacy students at Polish universities and the quality of education. Attention was also paid to the atmosphere at the university, systemic inadequacies declared by students at individual universities, and the didactic skills and attitudes of academic staff towards students. The collected data made it possible to analyze and evaluate the impact of the above factors on mental health and satisfaction with the course of study at pharmaceutical faculties in different academic centers in Poland.

Other researchers have indicated that medical faculties, including pharmacy, place high demands on the amount of knowledge acquired, its enforcement and the practical skills necessary while working in the profession since human health and life are directly at stake. Students have reported high levels of stress, which are described as up to twice that of the general adult population.[11] Several studies have shown that this is especially true for students in medical professions (e.g., medicine, pharmacy).[12–14] Students experience high stress due to their study load, the large number of exams or the high difficulty of tests.[15] According to our results, women reported higher levels of stress than men.[16,17] As in our study, high levels of stress, anxiety and emotional distress were shown to lead to the development of depression and anxiety states,[18] of which were also more frequently experienced by women.[19,20] Our study found a correlation between sex and stress response, incidence of depression and experience of anxiety in the academic community. An increased incidence of the aforementioned conditions was observed in women.

The COVID-19 pandemic also had an impact on mental health and was a triggering factor for stress and anxiety among students. One of the effects of the pandemic was reduced physical contact with other people and decreased interaction with peers, which fostered depression.[21] A study conducted in Saudi Arabia found that medical students taking classes on a classroom basis with the onset of the COVID-19 pandemic began to feel less anxious after the introduction of classes conducted remotely. This may have been due to a greater sense of security and a lower risk of virus infection facilitated by frequent physical contact with people.[22] Also, a study published in 2022 showed a direct link between greater feelings of stress and poorer wellbeing among students. The effects of the mental burden caused by academic problems and the additional stressor of a newfound illness worsened the overall wellbeing of respondents.[23]

The COVID-19 pandemic has exacerbated the symptoms of depression in those diagnosed but also increased the number of patients suffering from the disorder. Experiencing stress due to the pandemic and online learning is one of the risk factors for depression. It has been shown that people with hobbies experienced less stress during the pandemic and thus had a lower risk of developing depression.[24,25] A solution to the problem of lack of hobbies could be the organization of extracurricular activities by the university, such as canoeing, team games and movie nights.

Lack of time to develop one's passions or engage in non-curricular activities, as indicated by participants in our study, can significantly affect wellbeing. Our results suggest that students who did not find time for non-curricular activities suffered the negative effects of prolonged stress in the form of depression and anxiety, which were often exacerbated and

required sedatives. A cross-sectional study conducted in Jordan with medical students also supports our hypothesis that hobbies have an impact on wellbeing and mental health.[26] A study conducted in the UK involving dental students also found that the opportunity to develop hobbies contributed to less stress and better wellbeing among students and had a beneficial effect on study–life balance.[27]

Two studies conducted in Southern Africa, which focused on satisfaction with studies, the psychological needs of pharmacy students and challenges along the path of study, indicated the importance of support directed to students by university lecturers. It was noted that students who reported being overwhelmed by a large amount of material perceived less support from lecturers.[28,29] A Nigerian study found little effect of mentoring on improving and meeting students' psychological needs despite its advantages in enhancing work motivation, study habits and academic performance.[30] The data show that there is a need to support students both in terms of professional orientation, increasing performance in completing academic activities, as well as supporting students' mental status, relieving the mental burden of academic pressure, and developing soft skills and social skills. The establishment of friendly contact by academics with students, as demonstrated in our study, can build an attitude of openness among students and overcome the internal barrier against asking questions of instructors, as well as enable them to draw on guidance and information from their professional experience.

The survey showed that a large percentage of students are unaware of the possibility of mentoring and tutoring at their university. This may be due to a lack of awareness among academics about the possibility of such initiatives and a general failure to disseminate information on the subject. The majority of respondents would be willing to take advantage of such an initiative, which could have a positive impact on talent and skill development, as well as the development of appropriate individual standards for self-improvement. This in turn would enable them to learn about areas of future professional work in which they could specialize and feel confident. The 2020 review and the 2023 analysis proved that the impact of positive mentor–student relationships can benefit mentees in their professional development, reducing differences in their experiences, but also in social aspects. It has also been emphasized that mentoring itself can have an impact on students' wellbeing and should be considered by programs and academia, as it is an important tool to enhance the development of professional identity.[31,32]

Receiving feedback is one of the most important aspects of quality education. It has been identified as a key component of clinical education programs and one of the most important tools affecting the ability to develop skills and engage in learning. Feedback can also play a part in communicating the progress made by the student.[33] Our research indicates that only 17.2% of students received feedback from academics in the form of praise for progress and strengths. It can have a significant impact on student motivation, but also, in particular, on improving the quality of the tasks performed – drawing attention to activities performed correctly, as well as pointing out elements that need to be improved or changed to avoid mistakes in the future. In another Polish study evaluating students' practical preparation for the profession, students pointed out the problem of insufficient practical preparation in the provision of pharmaceutical care, despite the fact that the students had adequate theoretical knowledge and that the competence of their academic teachers and the level of knowledge the teachers imparted was rated high. It was also pointed out that greater use of a variety of active teaching methods would improve the quality of student preparation in this area.[34] Assessment is an important aspect of educational quality and is a key function affecting the educational process, as it can be used to improve subsequent learning.[35] As an important component, it should be used in a standardized and unbiased manner. Our survey results show a positive trend, with 84.5% of university teachers consistently following established grading rules.

The quality of education, according to research reports, varies from university to university. A cross-sectional survey of Kuwait University's pharmacy students found that most students were satisfied with the quality of education. A total of 78.5% of respondents indicated that the study program had developed their problem-solving skills, and 66.4% also admitted that it had improved their communication skills. Unfortunately, in the same survey, 88% felt that the workload put a heavy physical as well as mental strain on them, which was also confirmed by the results of our survey.[36] In Brazil, 467 pharmacy schools were analyzed, most of which scored excellent in the category of quality of education.[37] Student achievement was considered in terms of factors of educational quality, but unfortunately, student opinions on educational quality were not included. This poses a problem in a reliable evaluation, as it does not provide information on the quality of education but only on educational outcomes, which may be, e.g., due to students' abilities.

A problem faced by students is the phenomenon of ageism, i.e., ignoring the opinions of young people due to age and inexperience as perceived by the academic faculty. In the field of healthcare, it has been shown that the older the patient is, the less biased the assessment of their clinical problem is. Thus, more unfairly, younger people face more subjective evaluation.[38] This phenomenon is the cause of a decrease in the quality of healthcare for young people due to ignoring their symptoms and opinions about their own health. The effect of experiencing ageism can also result in a lack of desire to help the elderly in the future due to fear of being judged.[39] The feeling that a younger person's opinion does not count also contributes to greater stress and, thus, the development of mental illness.[40] Our results confirm that students ignored due to "inexperience" do not feel motivated to learn ($p < 0.0001$, $df = 2$) and are at risk of long-term stress effects ($p = 0.0016$, $df = 4$).

Data from our survey show that the desire to work in a health-related field was the main motive for choosing

a degree program. Many students chose this major because they were not admitted to their other dream studies. For 40.5% of pharmacy students in Kuwait, not being accepted to a university was the main reason for choosing this major.[36] In the UAE, encouragement from family (84.5%), the desire to obtain a medical degree, e.g., the title of pharmacist (79.0%), and personal interests (71.0%) were the deciding factors in choosing to study pharmacy.[41] A study conducted in the USA identified anticipatory socialization, career orientation and the desire to help others as the main motivations of students.[42] A significant proportion of pharmacy students in the UK do not plan to work in the profession in which they were trained.[43] A survey conducted in Saudi Arabia identified the following as the main factors in choosing pharmacy: the desire to work in a respected profession (83.7%), the desire to work in a popular and sought-after profession (81.7%) and encouragement from family members (66.0%).[44]

The career plans of Polish students are another important finding of our survey. Various career paths are available to them, including work in a general pharmacy, a hospital pharmacy, the pharmaceutical industry (laboratories, pharmacovigilance departments, drug registration), in the field of clinical research, and in academia. Respondents to this survey mainly declared a desire to work in community pharmacies. In contrast, almost half of the students in Kuwait and the majority of students in the UAE and Saudi Arabia expressed a desire to work in a hospital pharmacy.[45] Swedish pharmacy students, when asked where they would like to work after graduation, also indicated a community pharmacy. It also represented the first place of work for most of the country's graduates.[46]

Limitations

Although the purpose of our survey was to assess teaching standards, mental health and student–teacher relationships among pharmacy students in Poland, it is important to be aware of certain limitations that may affect the interpretation of the results. The difficulty of reaching all respondents and the risk of over-representation (too much variation in the number of respondents from different universities) were limitations of this study. In addition, our cross-sectional methodology, cultural differences between different regions of Poland and the lack of additional relevant variables were elements that may have affected the results. It is important to understand that the survey covers a specific group of students, and a cause-and-effect relationship cannot be established in every area. Finally, in assessing the accuracy of our survey, it is important to consider the risk of misunderstanding the questions and the lack of supplementary information, such as accurate descriptions of particular situations. Despite these limitations, the survey provides reliable information on the perceptions and experiences of pharmacy students in Poland. In presenting the results, these limitations have been taken into account.

Conclusions

Assessing the impact of higher education on students' mental state can help understand psychological conditions in relation to education, academic achievement, perception, and impact on future professional life. Given the evolving role of the pharmacist in patient care, it is important to take a closer look at students' mental resilience and potentially implement appropriate solutions. This action could prevent the deteriorating mental status of students preparing for the profession.

The results of our study may be helpful in implementing preventive measures to prevent the development of depression and anxiety among students and in developing therapeutic strategies for those affected by these disease symptoms. They also draw attention to the proper psychological preparation of students for entry into the healthcare system, which is the key to a rewarding and sustainable career. Medical school authorities should take the lead in destigmatizing mental illness and promoting help-seeking behavior when students are stressed and anxious. Many universities offer psychological help to students, but as our survey indicates, few students take advantage of it.

Data availability

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Consent for publication

Not applicable.

ORCID iDs

Dorota Bęben https://orcid.org/0009-0001-0564-6033
Monika Birska https://orcid.org/0009-0002-5110-534X
Łukasz Gądek https://orcid.org/0009-0009-8499-4199
Dominik Marciniak https://orcid.org/0000-0002-3326-0840
Katarzyna Karłowicz-Bodalska https://orcid.org/0000-0002-4237-9720

References

1. Chankseliani M, McCowan T. Higher education and the Sustainable Development Goals. *High Educ*. 2021;81(1):1–8. doi:10.1007/s10734-020-00652-w
2. Hall S. A mental-health crisis is gripping science: Toxic research culture is to blame. *Nature*. 2023;617(7962):666–668. doi:10.1038/d41586-023-01708-4
3. Lattie EG, Adkins EC, Winquist N, Stiles-Shields C, Wafford QE, Graham AK. Digital mental health interventions for depression, anxiety, and enhancement of psychological well-being among college students: Systematic review. *J Med Internet Res*. 2019;21(7):e12869. doi:10.2196/12869
4. Sheldon E, Simmonds-Buckley M, Bone C, et al. Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. *J Affect Disord*. 2021;287:282–292. doi:10.1016/j.jad.2021.03.054
5. Eisenberg D, Gollust SE, Golberstein E, Hefner JL. Prevalence and correlates of depression, anxiety, and suicidality among university students. *Am J Orthopsychiatry*. 2007;77(4):534–542. doi:10.1037/0002-9432.77.4.534

6. Lei X, Liu C, Jiang H. Mental health of college students and associated factors in Hubei of China. *PLoS One*. 2021;16(7):e0254183. doi:10.1371/journal.pone.0254183
7. Laidi C, Blampain-Segar L, Godin O, De Danne A, Leboyer M, Durand-Zaleski I. The cost of mental health: Where do we stand in France? *Eur Neuropsychopharmacol*. 2023;69:87–95. doi:10.1016/j.euroneuro.2023.02.004
8. Ornell F, Schuch JB, Sordi AO, Kessler FHP. "Pandemic fear" and COVID-19: Mental health burden and strategies. *Braz J Psychiatry*. 2020;42(3):232–235. doi:10.1590/1516-4446-2020-0008
9. Jones EAK, Mitra AK, Bhuiyan AR. Impact of COVID-19 on mental health in adolescents: A systematic review. *Int J Environ Res Public Health*. 2021;18(5):2470. doi:10.3390/ijerph18052470
10. Lee J, Solomon M, Stead T, Kwon B, Ganti L. Impact of COVID-19 on the mental health of US college students. *BMC Psychol*. 2021;9(1):95. doi:10.1186/s40359-021-00598-3
11. Silva RG, Figueiredo-Braga M. Evaluation of the relationships among happiness, stress, anxiety, and depression in pharmacy students. *Curr Pharm Teach Learn*. 2018;10(7):903–910. doi:10.1016/j.cptl.2018.04.002
12. Fischbein R, Bonfine N. Pharmacy and medical students' mental health symptoms, experiences, attitudes and help-seeking behaviors. *Am J Pharm Educ*. 2019;83(10):7558. doi:10.5688/ajpe7558
13. Garber MC. Exercise as a stress coping mechanism in a pharmacy student population. *Am J Pharm Educ*. 2017;81(3):50. doi:10.5688/ajpe81350
14. Ibrahim MB, Abdelreheem MH. Prevalence of anxiety and depression among medical and pharmaceutical students in Alexandria University. *Alexandria J Med*. 2015;51(2):167–173. doi:10.1016/j.ajme.2014.06.002
15. Samreen S, Siddiqui NA, Mothana RA. Prevalence of anxiety and associated factors among pharmacy students in Saudi Arabia: A cross-sectional study. *Biomed Res Int*. 2020;2020:2436538. doi:10.1155/2020/2436538
16. Votta RJ, Benau EM. Predictors of stress in doctor of pharmacy students: Results from a nationwide survey. *Curr Pharm Teach Learn*. 2013;5(5):365–372. doi:10.1016/j.cptl.2013.06.014
17. Rincón-Cortés M, Herman JP, Lupien S, Maguire J, Shansky RM. Stress: Influence of sex, reproductive status and gender. *Neurobiol Stress*. 2019;10:100155. doi:10.1016/j.ynstr.2019.100155
18. Aktekin M, Karaman T, Senol YY, Erdem S, Erengin H, Akaydin M. Anxiety, depression and stressful life events among medical students: A prospective study in Antalya, Turkey. *Med Educ*. 2001;35(1):12–17. doi:10.1046/j.1365-2923.2001.00726.x
19. Puthran R, Zhang MWB, Tam WW, Ho RC. Prevalence of depression amongst medical students: A meta-analysis. *Med Educ*. 2016;50(4):456–468. doi:10.1111/medu.12962
20. Venkatarao E, Iqbal S, Gupta S. Stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. *Indian J Med Res*. 2015;141(3):354. doi:10.4103/0971-5916.156571
21. Sauer N, Sałek A, Szlasa W, et al. The impact of COVID-19 on the mental well-being of college students. *Int J Environ Res Public Health*. 2022;19(9):5089. doi:10.3390/ijerph19095089
22. Saddik B, Hussein A, Sharif-Askari FS, et al. Increased levels of anxiety among medical and non-medical university students during the COVID-19 pandemic in the United Arab Emirates. *Risk Manag Healthc Policy*. 2020;13:2395–2406. doi:10.2147/RMHP.S273333
23. Barbayannis G, Bandari M, Zheng X, Baquerizo H, Pecor KW, Ming X. Academic stress and mental well-being in college students: Correlations, affected groups, and COVID-19. *Front Psychol*. 2022;13:886344. doi:10.3389/fpsyg.2022.886344
24. Gawrych M, Cichoń E, Kiejna A. Depression among young adults: Risks and protective factors in the COVID-19 pandemic. *Postep Psychiatr Neurol*. 2022;31(2):52–61. doi:10.5114/ppn.2022.118265
25. İlhan B, Küpeli İ. Secondary traumatic stress, anxiety, and depression among emergency healthcare workers in the middle of the COVID-19 outbreak: A cross-sectional study. *Am J Emerg Med*. 2022;52:99–104. doi:10.1016/j.ajem.2021.11.051
26. Seetan K, Al-Zubi M, Rubbai Y, Athamneh M, Khamees A, Radaideh T. Impact of COVID-19 on medical students' mental wellbeing in Jordan. *PLoS One*. 2021;16(6):e0253295. doi:10.1371/journal.pone.0253295
27. Jenkins S, Johnson I, Ginley J. Work, Stress and Play: Students' perceptions of factors impacting on their studies and well-being. *Eur J Dent Educ*. 2019;23(3):349–354. doi:10.1111/eje.12436
28. Basson MJ, Rothmann S. Antecedents of basic psychological need satisfaction of pharmacy students: The role of peers, family, lecturers and workload. *Res Soc Admin Pharm*. 2018;14(4):372–381. doi:10.1016/j.sapharm.2017.04.015
29. Basson MJ, Rothmann S. Pathways to flourishing among pharmacy students: The role of study demands and lecturer support. *J Psychol Afr*. 2019;29(4):338–345. doi:10.1080/14330237.2019.1647953
30. Jegede AO, Erhun WO, Oyinlola IO. Mentorship in pharmacy schools: Students' perspective. *Indian J Pharm Educ Res*. 2023;57(3):669–677. doi:10.5530/ijper.57.3.81
31. Park SK, Chen AMH, Daugherty KK, Frankart LM, Koenig RA. A scoping review of the hidden curriculum in pharmacy education. *Am J Pharm Educ*. 2023;87(3):ajpe8999. doi:10.5688/ajpe8999
32. Howard ML, Yuet WC, Isaacs AN. A review of development initiatives for pharmacy student and resident preceptors. *Am J Pharm Educ*. 2020;84(10):ajpe7991. doi:10.5688/ajpe7991
33. Nelson NR, Carlson RB, Corbett AH, Williams DM, Rhoney DH. Feedback for learning in pharmacy education: A scoping review. *Pharmacy (Basel)*. 2021;9(2):91. doi:10.3390/pharmacy9020091
34. Plewka B, Waszyk-Nowaczyk M, Cerbin-Koczorowska M, et al. Polish pharmacy students' attitudes toward undergraduate teaching and practical implementation of pharmaceutical care: A cross sectional study. *Int J Environ Res Public Health*. 2022;19(12):7358. doi:10.3390/ijerph19127358
35. Croft H, Gilligan C, Rasiah R, Levett-Jones T, Schneider J. Current trends and opportunities for competency assessment in pharmacy education: A literature review. *Pharmacy (Basel)*. 2019;7(2):67. doi:10.3390/pharmacy7020067
36. Awad A, Al-Haqan A, Moreau P. Motivations, career aspiration, and learning experience of students in the pharmacy program at Kuwait University: A tool to guide curriculum development. *Curr Pharm Teach Learn*. 2017;9(2):332–338. doi:10.1016/j.cptl.2016.11.018
37. Mara De Sousa Lopes N, Soares Gondim AP, Silva Soares AC, Barbosa Dos Santos D, Ribeiro De Sales Neto M, Pinto DM. A quantitative analysis of the quality of pharmacy education in Brazil. *Am J Pharm Educ*. 2019;83(3):6543. doi:10.5688/ajpe6543
38. Tomko JK, Munley PH. Predicting counseling psychologists attitudes and clinical judgments with respect to older adults. *Aging Ment Health*. 2013;17(2):233–241. doi:10.1080/13607863.2012.715141
39. Graham KL, King KD. Evaluating the working with older adults scale with clinical psychology doctoral students. *Gerontologist*. 2022;62(8):1217–1225. doi:10.1093/geront/gnac044
40. Teixeira S, Augsberger A, Richards-Schuster K, Sprague Martinez L. Participatory research approaches with youth: Ethics, engagement, and meaningful action. *Am J Commun Psychol*. 2021;68(1–2):142–153. doi:10.1002/ajcp.12501
41. Abduelkarem A, Hamrouni. The choice of pharmacy profession as a career: UAE experience. *Asian J Pharm Clin Res*. 2016;9(4):220–226. https://journals.innovareacademics.in/index.php/ajpcr/article/view/12014. Accessed February 2, 2024.
42. Keshishian F. Factors influencing pharmacy students' choice of major and its relationship to anticipatory socialization. *Am J Pharm Educ*. 2010;74(4):75. doi:10.5688/aj740475
43. Willis S, Hassell K, Noyce P. Career intentions of pharmacy students. *J Health Serv Res Policy*. 2008;13(2 Suppl):45–51. doi:10.1258/jhsrp.2007.007112
44. Alhaddad MS. Undergraduate pharmacy students' motivations, satisfaction levels, and future career plans. *J Taibah Univ Med Sci*. 2018;13(3):247–253. doi:10.1016/j.jtumed.2018.03.004
45. Mukhalalati B, Ashour M, Al Noami AE. Examining the motivations and future career aspirations of Qatari pharmacy students and alumni: A case study. *Curr Pharm Teach Learn*. 2020;12(11):1329–1339. doi:10.1016/j.cptl.2020.06.003
46. Gustafsson M, Mattsson S. Swedish pharmacy students' expectations and perceptions of their education and future pharmacy profession. *Pharmacy (Basel)*. 2019;7(4):139. doi:10.3390/pharmacy7040139