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Perception of Libyan pharmacy students toward their community pharmacy training experiences

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Background
Because pharmacists are on the front lines of patient care, it is critical to prioritize education and training for pharmacy students to develop 'patient-centered' clinicians. Regrettably, pharmacy education in Libya has fallen behind the actual practices provided by pharmacists.
Objective
This study was carried out to assess undergraduate pharmacy students' perceptions of their current pharmacy training practices and experiences.
Methods
A cross-sectional study was conducted among pharmacy students at the University of Tripoli Alahlia from October to December 2024. Throughout this period, a questionnaire was distributed to gather information about the pharmaceutical care services provided by the students during their experiential training, their views on training sites, and their overall training experience.
Results and conclusion
A total of 70 pharmacy students completed the questionnaire. The majority reported engaging in activities such as counseling patients on over-the-counter (OTC) medications, advising on prescription medications, and training in calculating the correct drug dosage (91.4%, 84.3%, and 82.9%, respectively). Most of the students (78.6%) assessed patient compliance with their treatment, and 74.3% identified patient-specific factors that affect health pharmacotherapy and/or disease state management. In addition, the students provided positive feedback regarding the results of their training experience, indicating that it improved their social skills (median = 5, IQR = 1), enhanced their academic and thinking skills, and improved their participation in the pharmacy profession (median = 4, IQR = 1). Although the students had done well with some training competencies during their training, they were not given adequate opportunities to meet other competencies, such as responding to drug information inquiries and performing physical assessments for patients when needed. Training programs should strive to strike a balance between promoting student satisfaction and achieving rigorous educational outcomes.

Keywords: pharmacy training, pharmacy student, pharmacy practice

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Introduction

Pharmacy education plays a pivotal role in preparing students to meet the dynamic demands of healthcare systems. The training site, whether it is a hospital, community pharmacy, or industrial setting, serves as an integral component of this education [1]. This is where theoretical knowledge meets practical application requirements, allowing students to gain firsthand experience in patient care, medication management, and professional communication [2]. For pharmacy students, these training sites are not merely academic obligations but also formative experiences that shape their professional identity, skills, and attitudes toward their future careers [3].

The perceptions of pharmacy students regarding their training sites are a significant determinant of the success and effectiveness of experiential learning. These perceptions can influence their engagement, satisfaction, and the extent to which they apply learned skills in real-world settings [4]. Positive perceptions often correlate with increased motivation, improved learning outcomes, and greater confidence in handling professional responsibilities [5]. Conversely, negative experiences at training sites may lead to dissatisfaction, reduced interest in the profession,

and a lack of readiness to face the complexities of pharmaceutical practice [6].

The diversity of training sites introduces a variety of factors that shape students' perceptions. Factors such as the quality of mentorship, the level of exposure to practical tasks, the professionalism of the work environment, and the availability of resources play crucial roles in shaping these perceptions [7]. Additionally, personal factors such as students' expectations, prior experiences, and career aspirations further influence how they perceive their training environment. Understanding these perceptions is essential for educators, site preceptors, and policymakers to design and implement effective experiential learning programs. The pharmacy training site serves as a bridge between the academic world and the professional landscape. It provides students with an opportunity to translate classroom-based knowledge into practice, developing critical skills such as clinical decision-making, patient counseling, and teamwork [9]. This practical exposure also enables students to witness real-world challenges faced by pharmacists, such as dealing with complex patient cases, adhering to regulatory standards, and managing time effectively. These experiences contribute significantly to students' professional growth and readiness to enter the workforce [10]. Despite the importance of training sites, there is considerable variability in the quality of experiences reported by pharmacy students. Some students describe their training experiences as highly rewarding, citing supportive mentors, diverse learning opportunities, and a stimulating work environment as key factors [11]. Others, however, reported challenges such as limited hands-on experience, inadequate supervision, or a lack of integration into the healthcare team. These discrepancies highlight the need to investigate and address the factors influencing students' perceptions of their training sites [12].

The structure and organization of the training program also play critical roles in shaping students' experiences. Well-structured programs that offer clear objectives, diverse learning opportunities, and regular assessments are more likely to be perceived positively [12]. On the other hand, poorly organized programs with vague expectations and limited activities can lead to frustration and disengagement among students. Furthermore, the alignment between students' expectations and the reality of the training experience significantly affects their perceptions. Students who enter the training site with realistic expectations are more likely to find the experience fulfilling than those whose expectations are unmet [13]. Understanding and addressing these factors is essential for optimizing the experiential learning experience and preparing students to excel in their future roles as pharmacists [14].

By prioritizing the quality of training sites and actively seeking feedback from students, stakeholders can ensure that pharmacy education continues to meet the evolving needs of the profession and society at large [15]. However, in Libya, no published study has assessed the perceptions of pharmacy students at their training site. Hence, this study is the first to explore Libyan pharmacy students' perceptions of their training sites. It also seeks to identify key factors influencing these perceptions and provide recommendations for enhancing experiential learning in pharmacy education.

Methods

Study design

A cross-sectional study was carried out to explore the perceptions of undergraduate pharmacy students at the University of Tripoli Alahlia (UTA) regarding their pharmacy training practices and experiences. The study was conducted from October to December 2024 and was approved by the Department of Pharmaceutical Sciences at UTA. (IRB:UTA-PH0710/2024).

Inclusion and exclusion criteria

Eligibility was limited to students in their third year or beyond who were actively engaged in their training sessions, and agreed to participate in this study. Students in their first two years were excluded because they had not yet begun their practical training.

Questionnaire development and data collection

A questionnaire adapted from a previous study [16] was used to gather data. It was designed in English to align with the study's objectives. Initially, the questionnaire was reviewed by three academic experts in pharmacy training to ensure its validity. Their feedback was incorporated into the questions when appropriate to finalize the version used. Following this, a pilot test was conducted with 5 undergraduate pharmacy students to assess the clarity and simplicity of the questions. The data from this pilot phase were not included in the final analysis. The internal consistency and reliability of the questionnaire were measured using Cronbach's α values of ≥ 0.922 across all study domains, indicating strong reliability.

The questionnaire contains two sections. The first section contains sociodemographic characteristics, whereas the second section contains items related to pharmacy students' perceptions of pharmacy practice experiences. For example, counseling of over-the-counter medications (OTCs), facilities

available at the pharmacy site, patient management, and assessing patient compliance with the treatment.

Data were collected by distributing printed questionnaires face-to-face. Only students who obtained training courses were asked to fill out the questionnaire. Information about the study's purpose, participants' voluntary participation, the confidentiality of the data gathered, and the anticipated time needed to finish the questionnaire were included on the first page.

Sample size calculation

The minimal sample size for this study was calculated via the following standard formula: $n = P \times (1- P) \times z2/d2$. A sample size of 86 students was considered representative. To determine the sample size, we used the most conservative proportion (P = 50%), 10% desired precision, and 95% confidence level.

Statistical analysis

After the data were collected, the questionnaire responses were entered into the Statistical Package for the Social Sciences (SPSS), version 22.0 (IBM Corp., Armonk, New York, USA). For ordinal Likert scale variables, the descriptive results are presented as medians and interquartile ranges (IQRs), whereas percentages are used for nominal variables. Cronbach's α was used to assess the questionnaire's reliability, indicating that the scales are appropriate for their purpose. A value of ≥0.7 indicates acceptable internal consistency.

Results

Sociodemographic characteristics of the participants

A total of 70 pharmacy students out of 86 responded to the questionnaire (response rate was 81.4%). Table 1 shows the sociodemographic of the participants. The majority of the students were female (44, 62.9%), whereas 26 (37.1%) were male. Most of them (17, 24.3%) were 5th-year students.

Table 1 Sociodemographic characteristics

Variables	n(%)
Gender	
Male	26(37.1%)
Female	44(62.9%)
Year of study	
3rd Year	17(24.3%)
4th Year	19(27.1%)
5th Year	34(48.6%)

Training site general information

The majority of the surveyed pharmacy students (62, 88.6%) were trained in Tripoli (the capital city of Libya), as shown in Table 2. Community pharmacies were the main training site for 57 (81.4%) of the responding students, and 61 (87.2%) of the students practiced an average of 1-49 prescriptions dispensed per day. Among the pharmacy training sites, 67 (95.7%) had electronic dispensing systems that help in finding the required drugs, and 55 (78.5%) had one pharmacy tutor available at the training site.

Students' provision of pharmaceutical services during hands-on training

As shown in Table 3, the majority of the students had practiced counseling on OTC medication 64 (91.4%), performed patient counseling on prescription medication 59 (84.3%), conducted required dose calculations on the basis of patient information 58 (82.9%), assessed patient compliance with their treatment 55 (78.6%), identified patient-specific factors that affect health pharmacotherapy and/or disease state management 52 (74.3%), and evaluated patient information 50 (71.4%%). Crucially, students were not given adequate opportunities to perform physical assessments for patients when needed 27 (38.6%) and responded to drug information inquiries 5 (7.1%).

Table 2 Training site general information

Variables	n(%)
Practice site location	
Inside Tripoli	62(88.6%)
Outside Tripoli	8(11.4%)
Type of training site	
Community pharmacy	57(81.4%)
Hospital pharmacy	13(18.6%)
Average number of prescriptions dispensed per day	
1-49	61(87.2%)
50-99	7(10%)
100 – 149	1(1.4%)
> 150	1(1.4%)
Dispensing software available	
Yes	67(95.7%)
No	3(4.3%)
Number of pharmacy tutors on site during training.	
1	55(78.5%)
2	9(12.9%)
3	3(4.3%)
More than 3	3(4.3%)

Table 3 Pharmacy students' provision of pharmaceutical services during their hands-on training

Quires	Yes	no
	n(%)	n(%)
1. Responding to drug information inquiries	5(7.1)	65(92.9)
2. Counseling patient on prescription medication	59(84.3)	11(15.7)
3. Counseling on OTC medication	64 (91.4)	6 (8.6)
4. Evaluation patient information	50(71.4)	20(28.6)
5. Identifying patient specific factors that affect health pharmacotherapy and/or disease state management	52(74.3)	18(25.7)
6. Performing required dose calculate based on patient information	58(82.9)	12(17.1)
7. Assessing patient compliance to their treatment	55(78.6)	15(21.4)
8. Conducting physical assessment for patient when needed	27(38.6)	43(61.4)

Perception of students toward training sites

The majority of the surveyed students provided positive feedback toward their training site, as shown in Table 4. The majority of the participating students stated that the training site ensured that the patients were confidential 64 (91.4%), practiced an adequate prescription volume of 60 (85.7%), provided pharmaceutical care services suitable for all people with adequate pharmacy staff 59 (84.3%), had an adequate volume of OTC drugs 58 (82.9%), and had an adequate patient population needed to meet the learning objectives 51 (72.9%). Approximately half of the students (36, 51.4%) reported that the training site was equipped with appropriate drug information resources and was provided opportunities to interact with other health care providers.

Table 4 Students' perceptions of training sites

Quires	Yes	no
	n(%)	n(%)
1. The training facility where I gained experience had suitable resources for drug information.	36(51.4)	34(48.6)
2. The training facility where I gained experience seemed to have a sufficient supply of over-the-counter medications.	58(82.9)	12(17.1)
3. The training facility where I gained experience had a patient population that met the necessary learning objectives.	51(72.9)	19(27.1)
4. The training facility where I gained experience had a sufficient number of prescriptions for effective learning during the training.	60(85.7)	10(14.3)

5. The training facility where I gained experience offered pharmaceutical care services appropriate for everyone.	59(84.3)	11(15.7)
6. The training facility where I gained experience allowed for interaction with other healthcare professionals.	36(51.4)	34(48.6)
7. The training facility where I gained experience was properly staffed to provide high-quality pharmaceutical care services to patients.	59(84.3)	11(15.7)
8. The training facility where I gained experience ensured patient confidentiality	64(91.4)	6(8.6)

Perception of the training experience's outcomes

As shown in Table 5, the students provided positive feedback regarding the results of their training experience, indicating that it improved their social skills (median = 5, IQR = 1), enhanced their academic and thinking skills, and improved their participation in the pharmacy profession (median = 4, IQR = 1).

Table 5 Students' perceptions of training outcomes

Statements	Median (IQR)
1. The training experience improved my contribution with pharmacy profession	4.0 (1.0)
2. The training experience aided in my academic skills	4.0 (1.0)
3. The training experience aided in my social skill skills	5.0 (1.0)
4. The training experience aided in my critical thinking skills	4.0 (1.0)

Discussion

The results of this study provide an overview of pharmacy students' experiences and perceptions regarding their hands-on training in pharmacy practice. Our results revealed positive feedback from the students about their training site.

In this study, the sample consisted of a predominately female (62.9%), with a higher representation of 5th-year students (48.6%). This distribution aligns with trends observed in pharmacy education, where women increasingly pursue careers in pharmacy [17,18]. The emphasis on 5th year students in this study may suggest that insights from students with more advanced training can provide a nuanced understanding of experiential learning, making their feedback especially relevant for curricular improvements and future student orientation initiatives. The majority of training occurred in community pharmacies (81.4%). This finding indicates that students were mainly exposed to community-based pharmacy practice, which is essential given the increasing role of community pharmacists in healthcare delivery. Overall, the high usage of dispensing software (95.7%) points to a modernized training environment that is crucial for preparing students for real-world pharmacy practice. The presence of pharmacy tutors was also significant, with 78.5% of sites having one tutor present. The availability of tutors is fundamental in providing direct mentorship, fostering learning, and enhancing the educational experience [19].

When examining the provision of pharmaceutical services, the analysis reveals several crucial trends. While a substantial number of students reported engaging in counseling on prescription (84.3%) and OTC medications (91.4%), only 7.1% were involved in responding to drug information inquiries. In line with these results, an earlier study conducted in United Arab Emeritus reported that 45.2% of the students had positive responses regarding their training sites, indicating that they contained adequate volumes of OTC medications [20]. Comparable outcomes were reported in previous studies performed in Qatar and Nepal [21,22]. This gap emphasizes a potential area for curricular enhancement. As reported in previous studies, the ability to respond effectively to drug information requests is a key competency for pharmacists, particularly in the evolving landscape of pharmacy practice where information retrieval skills are paramount [23].

Our findings also revealed that students, at their training site, had practiced adequate prescription volume, provided pharmaceutical care services suitable for all people with adequate pharmacy staff, and had an adequate patient population needed to meet the learning objectives, which yielded a positive outcome in their practical training.

A greater number of prescriptions reported in a previous study was found to be positively associated with increased student satisfaction with the training process [24], suggesting that these environments are conducive to practical training. This is significant, as exposure to a diverse range of medications is essential for developing competency in pharmacy practice [23]. Furthermore, our results imply that students expressed favorable opinions of

the training site they had chosen and satisfactory comments regarding the results of their training. Several aspects may donate to these findings, e.g., the communication between students and site tutors. In our study, 51.4% of the students were provided opportunities to interrelate with other healthcare providers, which improved their ability to understand various aspects of their training. As a result, this could improve student satisfaction and training effectiveness. A study conducted in Lebanon reported a better level of satisfaction in the community pharmacy setting than in the hospital setting. This may be attributed to the improved communication between students and site tutors in the community setting [25]. In addition, 72.9% were able to conduct patient interviews to gather patient information. This helps them develop better communication skills and helps them become "patient-centered" members of the pharmacy team with strong interpersonal and communication skills. Additionally, the high percentage of sites that ensured patient confidentiality (91.4%) underscores the commitment to ethical practices within pharmacy education. This finding may lead to a discussion about the significance of privacy and confidentiality in increasing patient trust and the professional responsibilities of future pharmacists.

The students reported overall positive perceptions regarding the impact of training on their professional skills, with social skills (median 5.0) ranking the highest. This emphasis on developing social skills corresponds with the evolving role of pharmacists as communicators and health advocates. Strong interpersonal skills are increasingly recognized as essential competencies in ensuring effective patient interaction, medication adherence, and health promotion [26]. The consistent rankings for contributions to academic skills and critical thinking (median 4.0) demonstrate that these practical experiences foster important cognitive capabilities that underlie effective clinical decision-making. Moreover, the interquartile ranges indicate a uniformity in students' responses, suggesting a collective agreement on the training's effectiveness across various dimensions. This highlights the consistent quality of training across different practice sites, which is crucial for maintaining competency standards in pharmacy education. This result is in line with more general trends in education, which hold that students' experiences and satisfaction are strongly influenced by the caliber of the learning environment and interactions rather than just knowledge acquisition [17]. This emphasizes how crucial it is to have a holistic approach to pharmacy education that incorporates training facilities, academic institutions, and local communities to produce pharmacists who can significantly impact the industry. Furthermore, high levels of satisfaction should not be mistaken for signs of knowledge acquisition, highlighting the need for a more complex understanding of the relationship between learning outcomes and satisfaction in pharmacy education.

Conclusion

This study is the first in Libya to assess the perceptions of pharmacy students toward their pharmacy training site and training outcomes. Our students expressed satisfaction with the results of their training experience and a favorable opinion of the training sites. Although the students had done well with some training competencies during their training, they were not given adequate opportunities to meet other competencies, such as responding to drug information inquiries and performing physical assessments for patients when needed. Training programs should strive to strike a balance between promoting student satisfaction and achieving rigorous educational outcomes.

Conflicts of interest

The authors declare there are no conflicts of interest.

Authors' contributions.

All author contributed equally

Ethical considerations.

The article was approved by the ethical committee of the university of Tripoli Alahlia, Libya

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