

Pharmacy students' attitudes to provide rational pharmaceutical care: A multi-institutional study in Jordan

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ABSTRACT

This study aims to assess the Jordanian pharmacy students' attitudes and perceptions toward providing rational pharmaceutical care. The study was conducted by administering an anonymous online survey (Standard Pharmaceutical Care Attitude Survey; PCAS) to pharmacy students at five public universities in Jordan. Descriptive statistics were used to describe participants response on the questionnaire items and one-way ANOVA were used for inferential statistics. A total of 884 responses met the eligibility criteria. The majority of participants (n=614, 69.5%) reported that they have been introduced to the pharmaceutical care concept in their program. The majority of participants reported positive attitudes toward the professional duty and benefit of pharmaceutical, more negatives attitudes were reported toward the return on effort. Participants who had a clerkship experience had significantly more positive attitudes toward six items of the PCAS. In conclusion, pharmacy students in Jordan have positive attitudes toward providing rational pharmaceutical care. The majority, however, perceived pharmaceutical care to be time-consuming and not worth the additional workload that it places on pharmacists. This study highlights opportunities to achieve more positive attitudes by mandating pharmaceutical care courses in pharmacy schools in Jordan and exposing students to real-world scenarios.

Keywords: Pharmacy education; Pharmaceutical care; Pharmacy students; Jordan

1. INTRODUCTION

Advances in pharmacy practice and the introduction of pharmaceutical care have transformed the pharmacy profession from traditional dispensing practices to more patient-centred care.¹ Pharmaceutical care has an impact on enhancing patient's medications and improving patients' quality of life.² Pharmacists are currently

providing more services to patients in addition to the traditional role of dispensing medication.¹ As an integral part of the health care team, the pharmacist takes responsibility for a patient's medication-related needs and problems, optimizing patient's use of medicine, reducing unnecessary medicine and polypharmacy, and improving patient's quality of life.³

The advancement of the pharmacist's role to be part of the health care team to maximize the health care provided to the patient should be met with expanding the scope of the pharmacist from being a medicine compounder, dispenser, or seller to include pharmaceutical care provision.⁴

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Pharmaceutical care is an essential element of healthcare that involves patient interviewing to take medication history, identifying, preventing, and resolving potential and actual medication-related problems such as drug-drug interaction, adverse drug reactions, polypharmacy, unnecessary medications, and designing an evidence-based care plan.^{2,5} A recent study from Jordan reported that the lack of patient-centred practices and medication review services while providing pharmaceutical care might contribute to the increase in the drug-drug interactions and drug-related problems.⁶

Pharmacy profession should be redirected in education and practice toward pharmaceutical care services by changing the undergraduate pharmacy curriculum to be more oriented to pharmaceutical care services.^{7,8} Also, new methods to enhance students' ability to understand new skills concerning pharmaceutical care practice, such as adding clinical and patient-oriented courses that help in identification, analysis, and prevention of drug therapy-related problems, should be a primacy for all pharmacy schools in Jordan.^{7,8} To update the curricula of pharmacy education in Jordan, pharmacy schools are required to update their curricula⁷ to mimic the changes in the pharmacy profession that have taken place in more developed countries.¹

The BSc. in pharmacy curricula in Jordan has little focus on pharmaceutical care skills, with little patient-oriented programs training courses.^{8,9} For instance, only Jordan University of Science and Technology and the University of Jordan have a mandatory pharmaceutical care course in their BSc. pharmacy and PharmD curricula.¹⁰⁻¹² Other universities either having an elective pharmaceutical care course such as Yarmouk university¹³ or teaching pharmaceutical care in one course integrated with communication skills such as the Hashemite University.¹⁴ While in other universities' pharmaceutical care, we could not identify pharmaceutical care in their curricula (e.g., Mutah University).¹⁵ However, an ongoing plan of curricula changes based on the Center for the

Advancement of Pharmacy Education (CAPE) outcomes has been reviewed and approved by all pharmacy school deans in Jordan. These new curricula will be implemented within the next two years and should incorporate more pharmaceutical care credit hours.

Pharmacy students' attitudes and perceived preparedness can be used as an influence and assessment tool to conduct pharmacy curricular change, revise, and improve pharmacy curricula.^{16,17} Regrettably, the concept of pharmaceutical care among Jordanian pharmacy students, has not been studied yet. Therefore, this study aims to assess the Jordanian pharmacy students' attitudes and perceptions toward providing rational pharmaceutical care.

Methods

Design

This cross-sectional study aimed to describe Jordanian pharmacy students' attitudes toward pharmaceutical care. The study was conducted at the beginning of the summer semester between July and August 2019. An anonymous online survey (Standard Pharmaceutical Care Attitude Survey; PCAS) to pharmacy students at public universities in Jordan. The study's protocol was approved by the Institutional Review Board (IRB) at King Abdullah University Hospital (reference number: 76/117/2018).

Participants

The study protocol aimed to recruit pharmacy students from all pharmacy schools in Jordan. However, the researchers had limited access and responses from private universities' students. Therefore, we modified our study protocol to invite pharmacy students in public universities to take part in this study. There are five public universities in Jordan that have pharmacy and PharmD programs: the university of Jordan (BSc. pharmacy and PharmD), Yarmouk University (BSc. Pharmacy), Jordan University of Science and Technology (BSc. pharmacy and PharmD), Mutah University (BSc. Pharmacy) and the Hashemite University (BSc. Pharmacy). Pharmacy and PharmD students from these public universities were invited to participate in this study

through social media groups (e.g., Facebook). The study protocol aimed to target students who were in their 3rd, 4th, 5th, and 6th academic year since first and second year courses are primarily introductory and basic science courses.¹⁰⁻¹⁵ Therefore, responses from 1st and 2nd-year students were excluded. Participants were provided with an electronic information study sheet and provided an online form of informed consent before taking the survey.

PCAS Survey

The online survey was prefaced with pharmaceutical care definition according to Helper and Strand¹⁸ and consisted of two sections. The first part consisted of eight questions to elicit demographic information of participants. The second part was the 13-item PCAS that aimed to assess participants' attitudes toward pharmaceutical care. PCAS is a five-point Likert scale (1=strongly disagree to 5=strongly agree) with evidence of validity and reliability and has been extensively used in the literature.¹⁹⁻²³ PCAS measures three constructs: professional duty (three questions), return on effort (two questions), and professional benefit (eight questions). Return on effort items were negatively worded and reverse scored so that the higher scores represent more positive attitudes toward pharmaceutical care. The survey questions were all written in English with an Arabic translation for each question to ensure participants understanding for all questions. The survey was piloted on 19 pharmacy students for face validity and no modifications were suggested. The pilot sample completed the survey in 4.5 minutes on average and their responses were not included in the final results.

Data Collection and Analysis

Data were collected using SurveyMonkey® (SurveyMonkey, Palo Alto, CA, USA) and exported directly to Statistical Package for Social Sciences (SPSS) software version 25 for analysis. Descriptive statistics used to analyze responses (i.e., mean score with standard deviations and percentage frequencies). In order to facilitate interpretation across the three constructs of PCAS, summated total scales were transformed to a 0-100 scale. Cronbach's alpha was calculated to estimate the internal consistency of the responses to PCAS. One-way ANOVA was used to assess the influence of socio-demographic characteristics of participants on their attitudes toward pharmaceutical care.

Results

A total of 1098 responses were completed, and 214 responses were excluded as they came from first- and second-year students. The response rate could not be calculated based on the Facebook groups members as many of these members did not meet the inclusion/exclusion criteria. However, we estimated the response rate to be 19.6% based on the total number of students enrolled in the eligible academic years at all five public universities. Out of the 884 responses who met the eligibility criteria, 700 (79.2%) were females with an average age of 22.04 years (Table 1). The majority of participants (n=605, 68.4%) were enrolled in a BSc pharmacy program 605 (68.4%) and have had an internship in a community pharmacy and/or hospital setting (n=673, 76.1%). The majority of participants (n=614, 69.5%) reported that they have been introduced to the pharmaceutical care concept in their program (Table 1). The Cronbach alpha was found to be 0.746 for the 13 PCAS items, which indicate acceptable overall reliability.

Table 1: Sociodemographic characteristics of participants (n=884)

	Variable	N(%)
Gender	Female	700 (79.2%)
	Male	184 (20.8%)
Academic Year	Third	203 (23%)
	Fourth	299 (33.8%)
	Fifth	327 (37%)
	Sixth	55 (6.2%)

	Variable	N(%)
University	University of Jordan	249 (28.2%)
	Yarmouk University	210 (23.8%)
	Jordan University of Science and Technology	217 (24.5%)
	Mutah University	106 (12%)
	Hashemite University	102 (11.5%)
Program	BSc Pharmacy	605 (68.4%)
	PharmD	279 (31.6%)
Cumulative GPA	Excellent	156 (17.6%)
	Very Good	354 (40%)
	Good	306 (34.6%)
	Satisfactory	68 (7.7%)
Took pharmaceutical care course	Yes	614 (69.5%)
	No	270 (30.5%)
Training experience	Training in community pharmacy and/or hospital setting	673 (76.1%)
	No previous training experience	211 (23.9%)
Age (mean \pm SD)	22.04 \pm 1.40	

Overall, participants had positive attitudes toward pharmaceutical care practice (Table 2). The majority of participants reported to have positive attitudes toward the professional duty and benefit of pharmaceutical, more negatives attitudes were reported toward the return on effort (Table 3). Over 90% of participants agreed that pharmacists' primary responsibility to prevent and solve medication-related

problems and should perform pharmaceutical care (Table 2). On the other hand, 76.1% of participants agreed that pharmacy students can perform pharmaceutical care during their clerkship. Despite that over half of the participants believed that pharmaceutical care does not take too much time and effort, 58.5% of them reported that it is not worth the additional workload it places on the pharmacists (Table 2).

Table 2: Students' attitudes towards pharmaceutical care per PCAS item (n=884)

		Mean \pm SD	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Professional duty	All pharmacists should perform pharmaceutical care	4.56 \pm 0.59	527 (59.6%)	331 (37.4%)	19 (2.1%)	6 (0.7%)	1 (0.1%)
	The primary responsibility of pharmacist in health care settings should be to prevent and solve medication problems	4.34 \pm 0.71	396 (44.8%)	415 (46.9%)	53 (6.0%)	3 (0.3%)	0
	Pharmacists primary responsibility should be to practice pharmaceutical care	4.20 \pm 0.77	337 (38.1%)	410 (46.4%)	108 (12.2%)	29 (3.3%)	0
Return on effort	Providing pharmaceutical care takes too much time and effort*	1.59 \pm 1.22	63 (7.1%)	185 (20.9%)	140 (15.8%)	319 (36.1%)	177 (20%)

		Mean ± SD	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist*	2.44 ± 1.25	185 (20.9%)	332 (37.6%)	140 (15.8%)	142 (16.1%)	85 (9.6%)
Professional benefit	Pharmacy students can perform their pharmaceutical care during their clerkship	3.97 ± 0.90	268 (30.3%)	405 (45.8%)	135 (15.3%)	74 (8.4%)	2 (0.2%)
	I think the practice of pharmaceutical care is valuable	4.53 ± 0.56	494 (55.9%)	369 (41.7%)	17 (1.9%)	4 (0.5%)	0
	I would like to perform pharmaceutical care as a pharmacist practitioner	4.45 ± 0.64	459 (51.9%)	378 (42.8%)	36 (4.1%)	10 (1.1%)	1 (0.1%)
	Providing pharmaceutical care is professionally rewarding	4.08 ± 0.89	318 (36%)	388 (43.9%)	119 (13.5%)	51 (5.8%)	8 (0.9%)
	I feel that the pharmaceutical care is the right direction for the provision to be headed	4.41 ± 0.67	438 (49.5%)	379 (42.9%)	55 (6.2%)	12 (1.4%)	0
	I feel that pharmaceutical care movement would benefit pharmacists	4.40 ± 0.69	437 (49.4%)	377 (42.6%)	53 (6%)	16 (1.8%)	1 (0.1%)
	I feel that pharmaceutical care movement will improve patient health	4.56 ± 0.56	525 (59.4%)	335 (37.9%)	21 (2.4%)	3 (0.3%)	0
	I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner	4.51 ± 0.63	507 (57.4%)	333 (37.7)	34 (3.8%)	9 (1%)	1 (0.1%)

* items were reverse scored.

Table 3: PCAS constructs descriptive analysis (scores transformed to a 0-100 scale)

	Mean ± standard deviation	Minimum: Maximum score	Range
Professional Duty	87.27 ± 10.39	40:100	60
Return on Effort	60.32 ± 19.36	20:100	80
Professional Benefit	87.29 ± 9.29	45:100	55

Students' attitudes toward pharmaceutical care were influenced by some socio-demographic variables (Table 4). Females participants had significantly more positive attitudes toward the two times of return on effort among

three other items (Table 4). BSc pharmacy students had significantly had more positive attitudes toward the value of pharmaceutical care than PharmD students. Moreover, participants who had an internship in community

pharmacy and/or hospital settings had significantly more positive attitudes toward the clerkship item among five

other items when compared to participants who did not have any internship (Table 4).

Table 4: Statistically significant association between sociodemographic characteristics and PCAS items

Demographic variable	PCAS question	Demographic variable subcategories		P value
		Male	Female	
Gender	All pharmacists should perform pharmaceutical care	4.45 ± 0.57	4.59 ± 0.59	.004
	Providing pharmaceutical care takes too much time and effort	2.05 ± 1.30	1.47 ± 1.17	< .001
	Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist	2.84 ± 1.7	2.66 ± 1.25	< .001
	I think the practice of pharmaceutical care is valuable	4.40 ± 0.56	4.57 ± 0.56	< .001
	I feel that pharmaceutical care movement will improve patient health	4.48 ± 0.58	4.58 ± 0.55	0.030
Program	I think the practice of pharmaceutical care is valuable	BSc Pharmacy	PharmD	
		4.57 ± 0.55	4.46 ± 0.57	.041
Training	All pharmacists should perform pharmaceutical care	No previous internship	Had an internship	
		4.47 ± 0.64	4.58 ± 0.57	.017
	Pharmacists primary responsibility should be to practice pharmaceutical care	4.03 ± 0.75	4.24 ± 0.77	.001
	Providing pharmaceutical care is not worth the additional workload that it places on the pharmacist	2.36 ± 1.18	2.47 ± 1.27	.041
	Pharmacy students can perform their pharmaceutical care during their clerkship	3.81 ± 0.82	4.02 ± 0.92	.002
	I feel that the pharmaceutical care is the right direction for the provision to be headed	4.29 ± 0.71	4.44 ± 0.65	.004
	I feel that pharmaceutical care movement will improve patient health	4.48 ± 0.58	4.59 ± 0.55	.018
Haven been introduced to pharmaceutical care at school	All pharmacists should perform pharmaceutical care	Yes	No	
		4.59 ± 0.57	4.49 ± 0.61	.021
	I feel that pharmaceutical care movement would benefit pharmacists	4.43 ± 0.68	4.31 ± 0.711	.023
	I feel that pharmaceutical care movement will improve patient health	4.60 ± 0.55	4.48 ± 0.58	.004
I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner	4.54 ± 0.62	4.44 ± 0.66	.037	

• One-way ANOVA test was used. Statistical significance represented by p <0.05

Discussion

The Jordanian government has a robust obligation concerning health and education programs. Pharmacy practice and education are developing, evidenced by the increase in the number of pharmacy schools and pharmacy students.²⁴ To illustrate more, there were eight pharmacy schools before 2009,²⁵ with eighteen pharmacy schools now.²⁴ However, the focus of pharmaceutical care in the pharmacy curricula is inefficient and lacking patient-oriented program training.^{7,8,26}

Continuous revisions of the pharmacy curriculum to keep up with the changing of the pharmacists' role is needed.¹⁷ Pharmacy students' attitudes and perceived readiness can be used to revise, improve, and influence the pharmacy curricular change. This study described the attitudes of Jordanian pharmacy students toward pharmaceutical care. Overall, pharmacy students in this study had positive attitudes toward pharmaceutical care practice. The finding of our study is consistent with the results of many studies where American,^{20,21} Nigerian,²⁷ Nepal,¹⁹ Saudi,²² Qatari²³ pharmacy students all positive attitudes toward pharmaceutical care practice. However, pharmacy students in this study had negative attitudes toward the return on effort for providing pharmaceutical practice. This is somehow consistent with previous studies in the Middle East region.^{22,23}

Data from our study suggested that some socio-demographic variables influenced students' attitudes toward pharmaceutical care. Females found to have more positive attitudes towards pharmaceutical care than males. Findings were supported by the results of previous studies.^{22,27} Moreover, participants who have been introduced to pharmaceutical care in their program or had a clerkship experience had significantly higher positive attitudes when compared to those who did not. Similarly, Chisholm and Wade reported that an overall increase in students' attitudes toward pharmaceutical care when they were introduced to actual patients in the classroom.²⁸ This concordance suggests that we can achieve higher students'

attitudes toward pharmaceutical care when training our students with real-world scenarios in the classroom and in clerkship.

The scope of practicing pharmaceutical care, attitudes and barriers toward this practice have not been thoroughly examined in Jordan,⁹ despite the importance of implementing pharmaceutical patient care in ensuring medication safety, enhancing cost-effective use of medicines, reducing medicines related morbidity and mortality and its economic burden.^{3,29,30} Although Jordanian pharmacists have positive attitudes toward the implementation of pharmaceutical care practice, several barriers have been identified which limit the implementation of pharmaceutical care practice in Jordan.^{7,9} Those barriers include the level of knowledge about providing pharmaceutical care, lack of a private counseling area at the community pharmacies, communicational difficulties in with physicians, lack of access to patient medical records,⁹ and weak emphasis on pharmaceutical care education and training of the undergraduate pharmacy education (i.e., BSc. in Pharmacy and PharmD) curricula in Jordan.^{8,26}

The slow change in the education programs and lack of pharmaceutical care jobs contribute to the present situation where the primary roles of the pharmacist in Jordan are more dispensing and marketing.⁸ In contrast, the future of pharmaceutical care in Jordan looks bright with the establishment of PharmD and Master of clinical pharmacy programs at the major universities in Jordan since the last two decades. Consequently, the role of the pharmacist in Jordan is expected to be expanded as a drug therapy consultant while providing pharmaceutical care, which is considered possible to be applied in Jordan.⁸

Strengths and Limitations

The strength of our study is that it is the first study conducted in Jordan to assess the pharmacy students' attitude, perception toward providing pharmaceutical care using the PCAS assessment tool. However, our study has limitations that need to be taken into consideration while

interrupting the results. Data from our study are self-reports of student's attitudes toward pharmaceutical care, where there is a risk that students may describe themselves in a more favorable light or to appear or referred to as hard-working students (i.e., social desirability bias). Moreover, the results of positive pharmacy students' attitudes towards providing pharmaceutical care from our study in Jordan may not be generalizable to other private schools of pharmacy in Jordan.

Our study is the first to evaluate pharmacy students' attitudes toward providing pharmaceutical care and is considered a vital contribution that helps influence the pharmacy curricula revision and change. Our study provides a piece of evidence to explore changes regarding the shift toward pharmaceutical care education and practice in Jordan. Results from our study are expected to influence the policy decision-making process of updating the pharmacy school curricula taking into consideration

the changes in the pharmacy profession that have taken place in more developed countries. This is significant and can influence the ongoing plan of curricula changes that have reviewed and approved by pharmacy schools' deans based on the CAPE educational outcomes. These changes mandate more pharmaceutical care credit hours be implemented within the next two years.

Conclusion

Overall, pharmacy students in Jordan have positive attitudes toward providing rational pharmaceutical care. The majority, however, perceived pharmaceutical care to be time-consuming and not worth the additional workload that it places on pharmacists. This study highlights opportunities to achieve more positive attitudes by mandating pharmaceutical care courses in pharmacy schools in Jordan and exposing students to real-world scenarios.

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توجهات طلبة الصيدلة نحو تقديم الرعاية الصيدلانية المثلى: دراسة متعددة المؤسسات في الاردن

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ملخص

تهدف هذه الدراسة إلى تقييم اتجاهات وتصورات طلبة الصيدلة في الأردن حول تقديم الرعاية الصيدلانية وذلك من خلال استبيان محكم تم توزيعه عبر الإنترنت. استهدفت هذه الدراسة طلبة الصيدلة في خمس جامعات حكومية في الأردن من خلال مجموعات التواصل الاجتماعي الخاصة بطلبة الكليات الخمسة. أكملت تعبئة الاستبيان ما مجموعه 884 طالب، وأفاد غالبية المشاركين (ن = 614 ، 69.5%) أنهم قد تعرّفوا على مفهوم الرعاية الصيدلانية خلال دراستهم. كما وجدت الدراسة أنّ غالبية المشاركين كانت لديهم مواقف إيجابية تجاه الواجب المهني وفوائد الرعاية الصيدلانية. ومع ذلك، اعتبرت الغالبية أنّ الرعاية الصيدلانية تستغرق وقتاً طويلاً ولا تستحق عبء العمل الإضافي الذي تضعه على كاهل الصيادلة. كما وجدت الدراسة أنّ الطلبة الذين لديهم تجربة في التدريب الميداني كان لديهم مواقف أكثر إيجابية تجاه ستة عناصر مقارنة بالطلبة الذين لم يكن لديهم تجربة في التدريب الميداني. تسلّطت هذه الدراسة الضوء على فرص تحقيق مواقف أكثر إيجابية وذلك بأن تكون مادة الرعاية الصيدلانية مادة اجبارية في كليات الصيدلة في الأردن وتقديم حالات عملية تحاكي الواقع لإعداد الطلبة ودفعهم للانخراط بسوق العمل وتقديم الرعاية الصيدلانية المثلى للمرضى..

الكلمات الدالة: التعليم الصيدلاني؛ الرعاية الصيدلانية؛ طلبة الصيدلة؛ الأردن.

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