

Assessment of Undergraduate Pharmacy Students' Attitude Towards Pharmaceutical Care in Pakistan: Practice Implications

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Iltaf Hussain¹
 Muhammad Fawad Rasool¹
 Imran Imran²
 Hamid Saeed³
 Furqan Hashmi³
 Muqarrab Akbar⁴
 Muhammad Asad Abrar¹
 Basit Ramzan⁵
 Muhammad Omer Chaudhry⁶
 Muhammad Islam³
 Areeba Usman⁷
 Naveed Nisar⁸
 Abdul Majeed¹

¹Department of Pharmacy Practice, Faculty of Pharmacy, Bahauddin Zakariya University, Multan 60800, Pakistan; ²Department of Pharmacology, Faculty of Pharmacy, Bahauddin Zakariya University, Multan 60800, Pakistan; ³University College of Pharmacy, University of the Punjab, Allama Iqbal Campus, Lahore 54000, Pakistan; ⁴Department of Political Science, Bahauddin Zakariya University, Multan 60800, Pakistan; ⁵Al Shifa Pharmacy, Multan, Pakistan; ⁶School of Economics, Bahauddin Zakariya University, Multan 60800, Pakistan; ⁷Nishter Medical Hospital, Multan, Pakistan; ⁸Department of Pharmaceutics, Faculty of Pharmacy, Bahauddin Zakariya University, Multan 60800, Pakistan

Correspondence: Abdul Majeed
 Department of Pharmacy Practice, Faculty of Pharmacy, Bahauddin Zakariya University, Multan, Pakistan
 Tel +92 3336139819
 Email abdulmajeed@bzu.edu.pk

Background and Purpose: Over the past few decades, the focus of pharmacy practice has been shifted from the classical role of drug dispenser to pharmacotherapy expert. Pharmacists now are more often involved in the patient care process by addressing the drug-related needs of the patients and this patient-centered approach is known as pharmaceutical care (PC). The present study was conducted to assess the attitude of pharmacy undergraduate students toward PC and various contributing factors that influence their preference towards it.

Method and Instrument: A descriptive cross-sectional study was conducted in 422 undergraduate pharmacy students by using a simple random sampling method. A pre-validated and self-reported Pharmaceutical Care Attitude Scale (PCAS) was used for assessing a student's attitude towards PC.

Results: Amongst the 422 undergraduate students, the majority were males (68.2%) and 70.4% were between the age group of 20 and 25 years. The students studying in third, fourth, and fifth year (final year) were 140 (33.2%), 142 (33.6%), and 140 (33.2%), respectively. Overall participant showed a positive attitude toward the PC. Professional year showed significant influence on professional duties (PD) ($p < 0.001$) and age was significantly associated with return on efforts (ROE) ($p < 0.001$) and professional benefits (PB) ($p < 0.001$).

Conclusion: Most of the participants showed a positive attitude toward PC and showed motivation to practice it. To promote PC practice in Pakistan, the government along with other professional bodies like Pakistan Pharmacists Association (PPA) should work together in collaboration with global health agencies to develop a well-structured advanced healthcare system in which there is a defined role of PC practice.

Keywords: attitude, clinical pharmacy, pharmaceutical care, pharmacy practice

Introduction

Over the past few decades, a paradigm shift has been seen in the role of the pharmacist, which was previously focused on drug dispensing only, but now it is targeted towards patient care.¹ The professional duties of pharmacists have been changed and now they are not only the compounder and supplier of pharmaceutical products, but they are more often involved in the patient care process by addressing the drug-related needs of the patients. This new patient-centered approach is known as pharmaceutical care (PC).²

PC is the multi-disciplinary, structured, and documented practice, which is focused on the detection, prevention, and resolution of drug-related problems.³

According to International Pharmaceutical Federation (FIP) PC is the responsible provision of drug therapy or medication-related care which aiming to achieve definite outcomes that improve quality of life (QoL) of the patient.⁴ While practicing PC, pharmacist in collaboration with other healthcare professionals takes direct responsibility for patient's drug-related needs for achieving the pre-defined goals of therapy.⁵ In PC, the pharmacist takes the professional responsibility for addressing and resolving drug-related problems of the patient.^{6,7} The PC provided by the pharmacist is an integral component of the patient care process. Moreover, it has been seen that the implementation of PC services in hospital and community settings has caused, improvement in disease outcome, reduction in hospital stay, improvement in medication adherence, and reduction in direct and indirect healthcare costs.⁸⁻¹²

It is known that pharmacy educators and practitioners have an important role in the development of students' interest in PC. Adamcik (1992) stated that the adequate knowledge, skills, and a set of values and attitudes which support the assumption of enhanced responsibility for performing PC is needed in pharmacy education.¹³ In support of this, Berardo expressed that "faculty at colleges of pharmacy should develop a teaching methodology that encourages the development of pharmacists who have the desire to practice PC".¹⁴ To adopt the PC concept in Pakistan, various initiatives have been taken, as in 2004, the Higher Education Commission Pakistan (HEC) and Pharmacy Council of Pakistan (PPC) collaboratively upgraded the bachelor of pharmacy (B.Pharmacy, four-year program) degree to Pharm.D (Doctor of Pharmacy) by incorporating new clinical pharmacy practice-based contents. The Pharm.D degree in Pakistan is a 5-year professional degree that is more focused on clinical pharmacy, as the pharmacy institutes must train their fourth and fifth Professional students in teaching hospitals by a structured clinical clerkship program.¹⁵

Despite the actions that have been taken by the authorities in Pakistan to adopt the PC concept, still, several barriers hinder the implementation of PC in the clinical settings. These barriers include patient burden in hospitals, lack of confidence, inadequate clinical knowledge, and poor communication skills of the pharmacist.¹⁶ The PC is not being practiced in Pakistan as it should be, the reason behind this is the ignorance by the health administration and policymakers.¹⁷ Moreover, the shortage of qualified professionals and lack of laws relating to PC

and their implementation also act as barriers to PC practice.¹⁸

Currently, the PC in Pakistan is in its developing stage and the role of pharmacists is not well recognized and they are not considered to be the part of the healthcare triangle.¹⁹ Therefore, it is very important to stimulate and promote a positive attitude in pharmacy undergraduate students toward PC. The present study was conducted between April 2000 and August 2000 to evaluate the attitude of pharmacy undergraduate students and the various factors that influences their preferences towards PC.

Methods and Instrument

Study Design, Population, and Setting

A descriptive cross-sectional study was conducted from April 2020 to August 2020 in the pharmacy undergraduate students enrolled in Pharm.D third, fourth, and final professional year at Faculty of Pharmacy, Bahauddin Zakariya University (BZU), Multan, Pakistan.

The BZU, Multan, Pakistan is the leading public sector institution in the most important and populous region of Pakistan (Southern Punjab). The Faculty of Pharmacy enrolls 200 students every year. The enrolled students come from different geographical locations of Pakistan and different countries. The BZU has specified reserves seats for International students (Nepal, Bangladesh, Afghanistan, Yemen, and Palestine), students from federally-administered tribal areas (FATA), students from Balochistan and Azad Kashmir regions, and children of overseas Pakistani's, who are working in different countries. The details of the student enrolment can be seen in [Supplementary Table S1](#).

Sample Size and Sampling Strategy

The Power and Sample size program[®] (Vanderbilt, USA) was used to determine the sample size of the study. The sample size was 422 and a simple random sampling (SRS) was used for the selection of students from each professional year. To see the impact of age on the students' attitude towards PC, a threshold of 20 years was used for the statistical analysis.

Study Instrument

In the current study, a pre-validated and self-reported Pharmaceutical Care Attitude Scale (PCAS) was used. The scale was developed in 1997²⁰ and has been tested/used in different studies.²¹⁻²⁴

PCAS scale was developed to evaluate the student attitude towards PC and it comprises of two parts. The first part represents the demographics data, which includes age, gender, and professional year of the participants. The second part of the instrument consisted of 13 items, which were classified into three main domains. These domains were professional duties (PD), return on efforts (ROE), and professional benefits (PB). The questions 1–3 represent professional duty, 4–5 represent return on effort, and 6–13 represent professional benefits.

Inclusion Criteria

Students were included if,

1. Their age was between 18 and 30 years
2. They were enrolled in Pharm.D third to fifth professional
3. They were willing to participate in the study.

Data Collection

The questionnaire was distributed randomly among pharmacy students enrolled in third, fourth, and fifth professional years after the grant of permission by the Department of Pharmacy Practice BZU, Multan. The students were instructed regarding the filling of the questionnaire. The responses were collected on PCAS by using a five-point Likert scale, where 1 indicates strongly agree and 5 represent strongly disagree. The total score of >26 indicated a negative attitude and <26 indicated a positive attitude. The complete data collection process can be seen in [Figure 1](#).

Ethical Consideration

Ethical approval for the study was granted by the ethical committee of the Department of Pharmacy Practice, Faculty of Pharmacy, Bahauddin Zakariya University, Multan, Pakistan (reference number Acad/PRAC/18-20/21). The participants were provided with information about the study through written and verbal consent form.

Permission for Use of PCAS

The permission for use of PCAS²⁰ was granted electronically by Bradley C Martin, the developer of the questionnaire.

Statistical Analysis

The statistical package for social sciences (SPSS) (IBM Corp. Armonk, NY) were used for the statistical analysis. Binary logistic regression was applied to assess the

association of independent variables with the PCAS. One-way ANOVA and independent *t*-test were applied to evaluate the influence of demographics on the PCAS domains. The chi-square (χ^2) test was used for measuring the association between the categorical variables and a *p*-value of <0.05 was considered as significant.

Results

Demographic Data

A total of 422 students participated in the study, amongst which, 288 (68.2%) were male and 134 (31.8%) were female. The majority of the participants fell in the age range of 20–25 years. The number of students studying in third, fourth, and final professional year was 140 (33.2%), 142 (33.6%), and 140 (33.2%) respectively. Demographic characteristics are shown in [Table 1](#).

Student's Attitude Toward Pharmaceutical Care

A positive attitude was seen in the respondents toward PC. Most of the participants strongly agreed with the statement that all pharmacists should perform PC 1.23 ± 0.42 (Likert scale mean score \pm SD) and it is an authoritative role of pharmacists to solve drug-related problems (DRPs) (1.66 ± 0.74). An overall good attitude was observed in the participants towards PC, as this movement would benefit the pharmacists (1.80 ± 0.96) and it is the responsibility of the pharmacist to practice and provide PC to the patients (1.8 ± 0.67). A moderate positive attitude was shown by the participants to the statements that PC practice is valuable (2.20 ± 1.02) and the majority of the participants showed their intentions that they will practice PC (2.0 ± 1.02). The majority of the participants agreed with the statement that PC can be performed during internship/clerkship (2.01 ± 1.0). The majority of participants believed that PC is professionally rewarding (1.96 ± 0.98) and its practice will benefit their professional career (1.85 ± 0.83). These responses can be seen in [Table 2](#).

Amongst the respondents, 422 (100%) considered that all pharmacists should perform PC, 390 (92.4%) favored that it is the primary responsibility of pharmacists to prevent and solve DRPs. Moreover, 148 (74%) participants favored that pharmacy students can perform PC during clerkship, whereas, 352 (83.5%) of the respondents were agreed with the statement that pharmacist's primary responsibility is to practice PC and 316 (77.2%) showed their intention towards active participation in providing PC

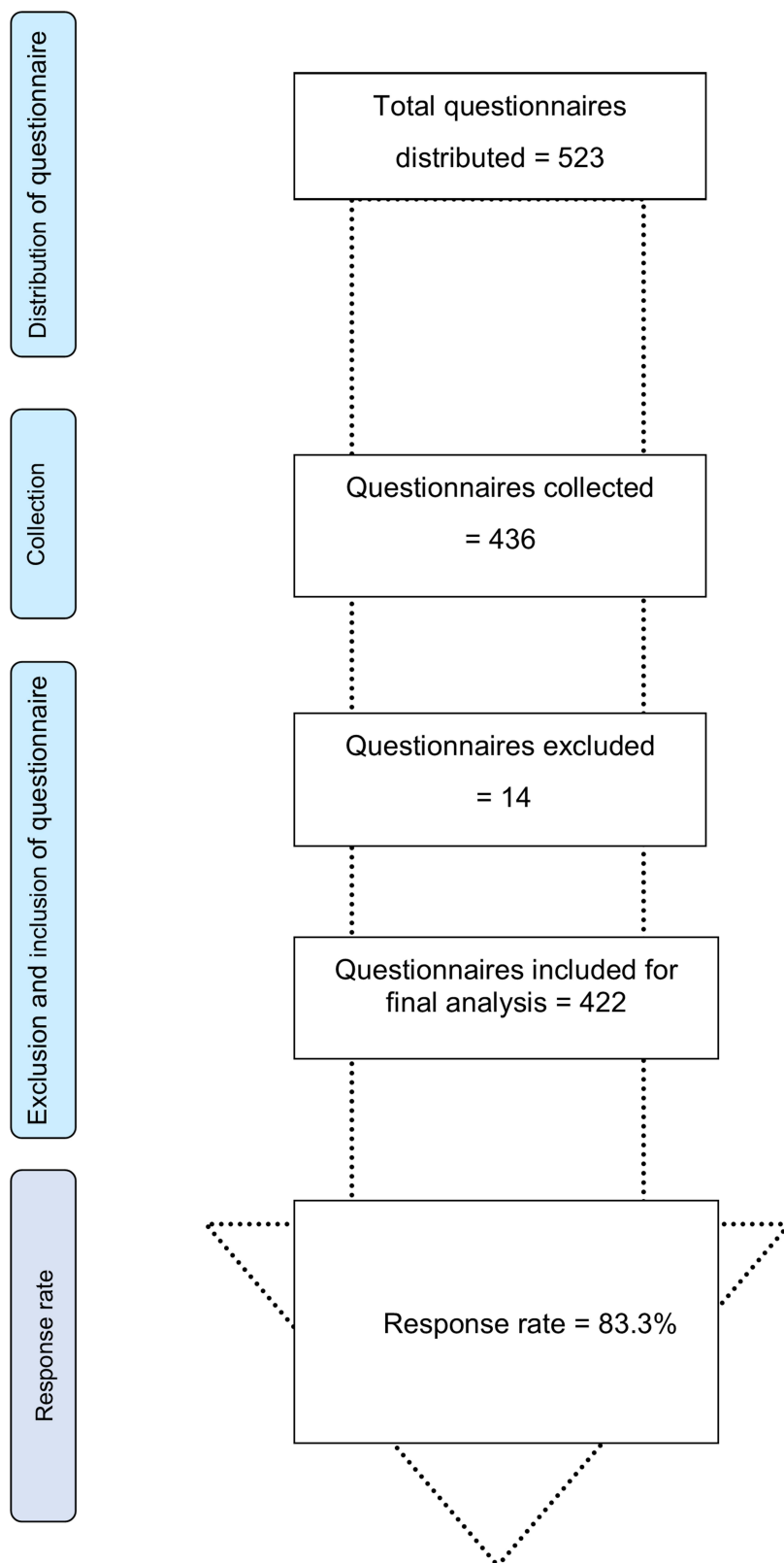


Figure 1 The process of data collection for the study.

Table 1 Demographics of the Participants

| Demographics Characteristics | | Frequency | Percentage |
|------------------------------|-------------|-----------|------------|
| Gender | Male | 288 | 68.2 |
| | Female | 134 | 31.8 |
| Age | <20 | 125 | 29.6 |
| | 20–25 | 297 | 70.4 |
| Professional Years | Third year | 140 | 33.2 |
| | Fourth year | 142 | 33.6 |
| | Fifth year | 140 | 33.2 |

as a pharmacy practitioner (Table 3). The association between the gender of students from the same study year and their attitude towards PC can be seen in [Supplementary Table S2](#).

The age of the student was significantly associated with ROE ($p < 0.001$) and PB ($p < 0.001$). Moreover, there was a significant difference across gender ($p = 0.008$) as shown in Table 4. An assessment of the influence of demographic characteristics of the respondents on their attitudes toward PC is presented in Table 5.

Discussion

This study evaluated the pharmacy undergraduate student's attitude toward PC and it also assessed various factors that influence their preferences towards it. The students were having overall a positive attitude toward the PC and their study year was significantly associated with the PD.

The pharmacy students in this study had a higher attitude score for PC. This finding is comparable to studies from Nigeria,²² Pakistan,²⁵ and Qatar.^{23,26} These similarities may be due to the similar disposition of the participants towards pharmaceutical care during pharmacy education. Moreover, the Pharm.D course in Pakistan is now more focused on clinical pharmacy and PC is an integral part of the course. The presence of a positive attitude in Pharm.D students gives a ray of hope for the future of clinical pharmacy practice in Pakistan.

It has been seen in this study that the participants who are in their final year were having higher attitude scores towards PD. This finding is consistent with similar reports from Saudi Arabia²¹ and Nigeria.²² These similarities may be because the final year students are involved in clinical clerkship in different clinical settings and are familiar with the PC concepts. Moreover, it is already known that the student's attitude can be developed and improved by the clinical clerkship course.²⁷

In our study, the attitude of male students was higher towards ROE as compared to females, this was not in line with the similar reports from Saudi Arabia²¹ and Qatar.²³ The inconsistency in results may be because the females residing in Southern Punjab, Pakistan are not allowed to interact freely with the professionals.

In this study, the gender and professional study year of the participants was not significantly associated with ROE and PB. These results are not in line with the similar reports from Nigeria²² and Qatar.²³ In Qatar, there is a well-structured healthcare system, where the pharmacist is an integral part

Table 2 Participant's PCAS Mean Score and Standard Deviation (SD)

| Questions | PCAS Score (Mean) | SD |
|--|-------------------|------|
| All pharmacist should perform pharmaceutical care | 1.23 | 0.42 |
| The primary responsibility of pharmacist in the health care setting should be to prevent and solve medication-related problems | 1.66 | 0.74 |
| Pharmacist primary responsibility should be to practice pharmaceutical care | 1.87 | 0.67 |
| Pharmacy students can perform pharmaceutical care during clerkship | 2.08 | 1.00 |
| I think that the practice of pharmaceutical care is visible | 2.20 | 1.02 |
| Providing pharmaceutical care takes too much time and effort | 2.44 | 1.10 |
| I would like to perform pharmaceutical care as a pharmacist practitioner | 2.00 | 1.02 |
| Providing pharmaceutical care is professionally rewarding | 1.96 | 0.98 |
| I feel that the pharmaceutical care is the right direction for the provision to be headed | 1.82 | 0.62 |
| I feel that the pharmaceutical care movement would benefits pharmacist | 2.01 | 0.84 |
| I feel that the pharmaceutical care movement will improve patient health | 1.80 | 0.96 |
| I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner | 1.85 | 0.83 |
| Providing pharmaceutical care is not worth the additional workload that it place on the pharmacist | 2.36 | 1.15 |

Table 3 Frequencies and Percentages of the Participant's Responses to PCAS

| | | Frequency (n) | Percentage (%) |
|--|------|------------------|-------------------|
| All pharmacist should perform pharmaceutical care | SA | 324 | 76.8 |
| | A | 98 | 23.2 |
| | Neut | 0 | 0.0 |
| | DA | 0 | 0.0 |
| | SDA | 0 | 0.0 |
| The primary responsibility of pharmacist in the health care setting should be to prevent and solve medication-related problems | SA | 195 | 46.2 |
| | A | 195 | 46.2 |
| | Neut | 13 | 3.1 |
| | DA | 19 | 4.5 |
| | SDA | 0 | 0.0 |
| Pharmacist primary responsibility should be to practice pharmaceutical care | SA | 126 | 29. |
| | A | 226 | 53.6 |
| | Neut | 70 | 16.6 |
| | DA | 0 | 0.0 |
| | SDA | 0 | 0.0 |
| Pharmacy students can perform pharmaceutical care during clerkship | SA | 128 | 30.3 |
| | A | 186 | 44.1 |
| | Neut | 64 | 15.2 |
| | DA | 34 | 8.1 |
| | SDA | 10 | 2.4 |
| I think that the practice of pharmaceutical care is visible | SA | 86 | 20.4 |
| | A | 243 | 57. |
| | Neut | 38 | 9.0 |
| | DA | 32 | 7. |
| | SDA | 23 | 5. |
| Providing pharmaceutical care takes too much time and effort | SA | 76 | 18.0 |
| | A | 193 | 45.7 |
| | Neut | 68 | 16.1 |
| | DA | 65 | 15. |
| | SDA | 20 | 4.7 |
| I would like to perform pharmaceutical care as a pharmacist practitioner | SA | 152 | 36.0 |
| | A | 174 | 41. |
| | Neut | 60 | 14. |
| | DA | 18 | 4.3 |
| | SDA | 18 | 4.3 |
| Providing pharmaceutical care is professionally rewarding | SA | 145 | 34.4 |
| | A | 200 | 47.4 |
| | Neut | 41 | 9.7 |
| | DA | 19 | 4.5 |
| | SDA | 17 | 4.0 |
| I feel that the pharmaceutical care is the right direction for the provision to be headed | SA | 126 | 29.9 |
| | A | 245 | 58.1 |
| | Neut | 51 | 12.1 |
| | DA | 0 | 0.0 |
| | SDA | 0 | 0.0 |

(Continued)

Table 3 (Continued).

| | | Frequency (n) | Percentage (%) |
|--|------|------------------|-------------------|
| I feel that the pharmaceutical care movement would benefits pharmacist | SA | 118 | 28.0 |
| | A | 208 | 49.3 |
| | Neut | 86 | 20.4 |
| | DA | 0 | 0.0 |
| | SDA | 10 | 2.4 |
| I feel that the pharmaceutical care movement will improve patient health | SA | 194 | 46.0 |
| | A | 167 | 39.6 |
| | Neut | 10 | 2.4 |
| | DA | 51 | 12.1 |
| | SDA | 0 | 0.0 |
| I feel that practicing pharmaceutical care will benefit my professional pharmacy career as a pharmacy practitioner | SA | 152 | 36.0 |
| | A | 204 | 48.3 |
| | Neut | 56 | 13.3 |
| | DA | 0 | 0.0 |
| | SDA | 10 | 2.4 |
| Providing pharmaceutical care is not worth the additional workload that it place on the pharmacist | SA | 110 | 26.1 |
| | A | 150 | 35.5 |
| | Neut | 80 | 19.0 |
| | DA | 64 | 15.2 |
| | SDA | 18 | 4.3 |

Abbreviations: SA, strongly agree; A, agree; Neut, neutral; DA, disagree; SDA, strongly disagree.

of the healthcare team. The PC practice is well established and the students see the practicing pharmacists in the clinical settings as their role models and this is lacking in Pakistan.²⁸ Whereas Nigeria started the 5-year undergraduate pharmacy program in 1979, which was upgraded to a Pharm.D six-year program in 2007.²⁹ In the Pharm.D program, students are given extensive professional clinical training (including pharmaceutical care) in different hospitals and community pharmacies. These are the probable reasons why student's attitude towards PC in Pakistan is not comparable to that in Nigeria.²⁹

The PC practice in Pakistan is in its developing stage and only 16 years have been passed since its inclusion in the undergraduate curriculum. The PC concepts were introduced for the very first time in the newly upgraded and implemented Pharm.D course, which is more focused on clinical pharmacy practice. Now the Pharm.D fourth and fifth Professional students must complete a structured clinical clerkship program in a clinical setting. Furthermore, with the latest revisions being approved by the curriculum review committee, few deficien-

Table 4 Influence of Gender and Professional Year on PD, ROE, and PB

| | | PD | | ROE | | PB | |
|----------------------|-------------|-------------|--------------|-------------|-------------------|--------------|-------------------|
| | | Mean (SD) | P-value | Mean (SD) | P-value | Mean (SD) | P-value |
| Age* | <20 | 4.66 (1.08) | 0.236 | 4.93 (2.45) | P<0.001 | 17.82 (5.00) | P<0.001 |
| | 20–25 | 4.80 (1.18) | | 4.01 (1.17) | | 15.55 (3.88) | |
| Gender* | Male | 4.77 (1.22) | 0.743 | 4.13 (1.61) | 0.008 | 16.42 (4.94) | 0.156 |
| | Female | 4.73 (0.99) | | 4.60 (1.86) | | 15.78 (2.68) | |
| Professional Years** | Third year | 4.74 (1.15) | 0.007 | 4.32 (1.77) | 0.538 | 16.33 (4.38) | 0.381 |
| | Fourth year | 4.73 (1.13) | | 4.15 (1.50) | | 15.82 (4.30) | |
| | Fifth year | 4.10 (1.17) | | 4.37 (1.84) | | 16.51 (4.40) | |

Notes: *Independent t-test, **One-way ANOVA. The bold figures show significant association between the independent variables and the domain of the PCAS ($P<0.05$).

Abbreviations: PD, professional duty; ROE, return on effort; PB, professional benefits; SD, standard deviation.

Table 5 Association of Demographics with Attitude by Using Binary Logistic Regression

| | | Attitude | | P-value | OR (CI) |
|--------------------|-------------|---------------|---------------|---------|-------------------|
| | | Positive | Negative | | |
| | | Frequency (%) | Frequency (%) | | |
| Gender | Male | 179 (62.2) | 109(37.8) | 0.800 | 0.947 (0.61–1.44) |
| | Female | 85(63.4) | 49(36.6) | | |
| | Total | 264(62.6) | 158(37.4) | | |
| Age | <20 | 67(53.6) | 58(46.4) | 0.014 | 0.586 (0.38–0.89) |
| | 20–25 | 197(66.3) | 100(33.7) | | |
| | Total | 264(62.6) | 158(37.4) | | |
| Professional Years | Third year | 88(62.9) | 52(37.1) | 0.621 | 1.063 (0.83–1.35) |
| | Fourth year | 92(64.8) | 50(35.2) | | |
| | Fifth year | 84(60.0) | 56(40.0) | | |
| | Total | 264(62.6) | 158(37.4) | | |

Abbreviations: OR, odds ratio; CI, confidence interval.

cies still exist in the clinical pharmacy part of the syllabus.³⁰ However, this does not mean that there is no room for further improvement and revisions in the current Pharm.D curriculum. Furthermore, there are still many shortcomings in the clinical pharmacy part of the implemented Pharm.D curriculum. For example, there is a very limited practical exposure for students to feel, see and understand their future role in public health, similarly the subjects assigned for therapeutics, community pharmacy, and pharmaceutical care are also insufficient to equip future graduates with the knowledge that will enable them to play an effective role in the patient care process.

Limitations

This study has a few limitations. Firstly, the data presented here is based on self-reported student's attitude toward PC.

Secondly, the positive attitude toward PC is seen in undergraduate students and it cannot be generalizable to the graduate pharmacist's community. Lastly, all the participants of this study were from the third, fourth, and final year of the Pharm.D program at Faculty of Pharmacy, BZU, Multan, Pakistan. Although these students were from the same university, but due to differences in social and geographical backgrounds, a multicultural environment prevails in BZU, as the students come from different geographical locations of Pakistan and also from different nationalities.

Conclusion and Recommendations

Most of the participants showed a positive attitude toward PC and showed motivation to practice it. To promote PC practice in Pakistan, the government along with other

professional bodies like Pakistan Pharmacists Association (PPA) should work together in collaboration with global health agencies to develop a well-structured advanced healthcare system in which there is a defined role of PC practice. The HEC and PCP should introduce practice-based clinical pharmacy courses in the Pharm.D curriculum, so that the undergraduate pharmacy students may have a better understanding of the various PC concept. Lastly, the health regulatory agencies in Pakistan should devise standard operating guidelines for the PC practice and measures should be taken for bridging the gap between physicians and pharmacists working in the clinical settings.

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Disclosure

The authors report no conflicts of interest in this work.

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