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Assessing student perceptions of the Pharm.D. degree at a private tertiary medical university in India

KOBI NATHAN*, KELLY M. CONN & CHRISTINE BIRNIE

Department of Pharmacy Practice, Wegmans School of Pharmacy, St. John Fisher College, New York 14618, USA.

Abstract

Background: Pharmacy education in India has expanded to include the Doctorate of Pharmacy degree (Pharm.D.). With clinical practice in early development, job opportunities in India are limited. Graduates often consider pharmacy opportunities abroad.

Aims: This study compares Indian students' career aspirations related to the Pharm.D. degree before and after beginning their programmes.

Methods: A 5-point Likert scale paper survey with open ended questions was distributed to all Pharm.D. students (Year 1- 6) at a medical university in India.

Results: With a response rate of 83% (144/173), over half of the students' primary goal was to pursue careers abroad post-graduation (54.2% before, 51.4% after). Data from the last three graduating classes indicated that 28.3% travelled abroad for future studies while 62.3% secured positions in India.

Conclusions: Opportunities abroad remain challenging for Indian trained Pharm.D.s'; graduates may consider the expanding clinical opportunities in India.

Keywords: *Indian Pharm.D., NABP, Pharmacy Education*

Introduction

In 1948, the year after India achieved its independence from the British, the government of India enacted the Pharmacy Act (Government of India, Ministry of Law, Justice and Company Affairs, 1948). This legal document was ratified as a means to regulate educational standards of the pharmacy practice curriculum, in addition to providing similar oversight to the profession and practice of pharmacy. The Pharmacy Council of India (PCI) was tasked to enforce the provisions of the Pharmacy Act (Pharmacy Council of India, 2016). Registration of diploma and degree holders and enforcing minimum standards required for qualification as a pharmacist fall under the purview of the PCI. The PCI regulates the Doctorate of Pharmacy (Pharm.D.) programme and the All India Council for Technical Education (AICTE) regulates all other pharmacy degree programmes (Bhuyan, 2013).

Prior to 2008, schools of pharmacy in India did not emphasise the study and implementation of pharmaceutical care in their curricula. Didactic training was limited to preparing future pharmacists who would venture into community pharmacy or the pharmaceutical industry upon graduation. The Bachelor of Pharmacy (B.Pharm.) degree helps prepare students who are interested in pursuing career opportunities in these settings. There is no standard curriculum and course structure varies between schools of pharmacy. In most institutions, course curricula cover subject matter focused on pharmaceutics, pharmacology, pharmacognosy, forensic pharmacy, analytical chemistry, physical, organic chemistry, and inorganic chemistry of medicinal products (Bhuyan, 2013).

With the advent of the Pharm.D. programme in 2008, pharmacy education in India experienced a shift toward the complete pharmaceutical care of the patient. Pharmacy curricula were expected to provide extensive experiential training to their Pharm.D. students, in addition to their didactic preparation. Whereas the B. Pharm. and Master of Pharmacy (M.Pharm.) curricula vary significantly between institutions, the Pharm.D. curricula is regulated and uniform in every school of pharmacy across India (Deshpande, 2013). The programme consists of six years of formal study; the first five years are completed successively in the classroom setting, with the final year spent in practice sites. In the final year of training, students are expected to complete six months of the internship in a general medicine department and the remaining time is to be spent equally at three other specialty areas (Bhuyan, 2013).

Upon graduation, Pharm.D. degree holders are eligible to pursue positions that provide clinical care to their patients. However, such opportunities are currently few in India. With the Pharm.D. degree being a relatively new programme, many hospitals, clinics, and primary care facilities are not equipped or prepared to hire the newly graduated pharmacist in their practice settings. Current Pharm.D. students may pursue their course of

*Correspondence: Ass. Prof. Kobi Nathan, *Department of Pharmacy Practice, Wegmans School of Pharmacy, St. John Fisher College, 3690 East Avenue, Rochester, NY 14618, Tel: +1 585 385 8033; Fax: +1 585 385 5295. Email: knathan@sjfc.edu*

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study with different final career goals in mind. While many students intend to stay in India and pursue job opportunities locally, others may pursue licensure or post-graduate training in the United States (U.S.), with the ultimate goal of securing clinical pharmacy positions and/or research fellowships in the U.S.

Over the years, pharmacy education in India has been broadly discussed in the literature (Chauhan & Singh, 2011; Hariharan 2011; Jishnu *et al*., 2011; Britto *et al*., 2013; Tharappel *et al*., 2014). To date, the authors are not aware of any published studies that have investigated Indian Pharm.D. students' perceptions of their course of study and their career aspirations post-graduation.

The objectives of this study were to: describe the perceptions and career aspirations of Pharm.D. students at a private tertiary medical university in India, and to compare and discern differences in students' perceptions prior to starting their academic tenure and during their preparation in school.

Methods

A cross-sectional study was conducted surveying Pharm.D. students from an Indian university about their perceptions of the Pharm.D. programme and career intent. The St. John Fisher College Institutional Review Board granted the study exempt status and approved all study procedures.

Subjects, Setting, and Recruitment

Study subjects included 1st - 6th year Pharm.D. students from a private tertiary medical university in India. To be eligible, students needed to be currently enrolled in the Pharm.D. programme in either the P1, P2, P3, P4, P5, or P6 year for the 2015-2016 academic school year. Students completing only a B.Pharm. were not eligible to participate.

Students were approached, as a group, during one of their courses and offered the opportunity to participate. The survey was distributed and completed via paper and pencil method; therefore students not in attendance at the time of distribution were not able to participate. Consistent with English-medium instruction at the university, the survey was conducted in English. Survey completion was voluntary and students' were able to decline participation. Students did not receive any compensation for completing the survey.

Measurements

Career path and Perceptions of Pharm.D. programme

Students were asked about their career path and perceptions of the Pharm.D. programme. Using a 5-point Likert scale, they rated their agreement (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree) to five statements regarding careers in pharmacy (Table Ia). A 'not applicable' option was also provided. Responses were grouped based on whether they agreed (strongly agree or agree) versus did not agree (neutral, disagree or strongly disagree). Additionally, students were asked to rate these questions twice; first they were asked to reflect on how they felt before beginning the pharmacy programme and then also their feelings at the time of survey completion (currently completing their course of study in the Pharm.D. programme). Responses were grouped based on before and after.

Pharm.D. vs. B.Pharm.

Students were asked to tell us, in a few words, why they chose the Pharm.D. programme over the B.Pharm. programme. Open-ended responses were reviewed for themes using a grounded theory approach. Following this open ended assessment, students were provided a list of reasons why some students had chosen the Pharm.D. programme over the B.Pharm. They were able to choose all that applied to them. Table Ib shows the six options that were provided to students; they were asked to choose all that applied to them. Reasons for preference for the Pharm.D. programme over the B.Pharm. programme were tallied for each response.

Table Ia & Ib: Pharmacy student survey: Career path, perceptions of Pharm.D. programme, and programme preference.

Ia: Career path and perceptions of Pharm.D. programme
I understood the career opportunities available to me with a Pharm.D. degree.
Graduates with a Pharm.D. from India have many job opportunities in India.
My primary goal is to pursue a career in India with my Pharm.D. degree.
Graduates with a Pharm.D. from India have many job opportunities abroad.
My primary goal is to pursue a career abroad with my Pharm.D. degree.
Ib: Pharm.D. vs. Bachelors in Pharmacy
More clinically-based, patient-focused opportunities are expanding for pharmacists in India and I look forward to be a part of the growth.
I am hoping to take my Pharm.D. degree abroad to a country where the Pharm.D. is the entry level pharmacy degree.
My family thought this was a better option for me and I had little input into the decision.
The Pharm.D. will better prepare me for a MS or PhD degree upon graduation.
The B.Pharm. was not a degree I ever considered.
None of the above apply

*Each question was scored on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree).

*A "not applicable" option was also provided.

Analysis

This study is based on a convenience sample of students enrolled in the P1-P6 cohorts (n=144). We performed all statistical analyses using Microsoft Excel 2013 and IBM® SPSS® Statistics v.24 for Windows (Armonk, NY). Descriptive statistics, including measures of central tendency, were used to assess normality of the data and to summarise the overall perceptions of pharmacy students. We compared responses before and after using McNemar's test.

Results

A total of 144 students completed the survey (144/173; response rate = 83%), which included all six pharmacy class cohorts (P1-P6). Among the study sample, each cohort represented the following proportion: P1-19.4%, P2-18.8%, P3-17.4%, P4-21.5%, P5-15.3%, P6-7.6%. Additional data provided by the principal's office at the same institution yielded further information about the university's pharmacy student population, including gender distribution among pharmacy classes as well as post-graduate education and job placement. Overall, there are 173 students in the 2015-2016 P1-P6 classes; 37.1% are male and 62.9% are female. This distribution is consistent throughout, with more females than males in each cohort. Additionally, among pharmacy students from this university, 28.3% of the last three graduating classes have traveled abroad for further studies and 62.3% of graduates have secured positions in India.

Figure 1 displays the percent agreement related to the students' career paths and perceptions of the Pharm.D. programme. Overall, the majority of students agreed that graduates with a Pharm.D. from India have many job opportunities abroad (before 72.2% and after 63.2%: *p*-value = 0.027); however few agreed that graduates with a Pharm.D. degree from India have many job opportunities in India (before 20.8% and after 24.3%). Over half agreed they understood the career opportunities available to them (before 56.3% and after 56.9%) and that their primary goal was to pursue a career abroad with their Pharm.D. degree (before 54.2% and after 51.4%). Fewer students agreed that their primary goal was to pursue a career in India with their Pharm.D. degree (before 38.3% and after 36.1%). Comparisons between responses before beginning the pharmacy programme and then after being enrolled in the programme were not statistically different except among the response regarding opportunities abroad (72.2% after vs. 63.2% before, *p*-value = 0.027).

Students were asked to choose from a list of options regarding why they entered the Pharm.D. programme over the B.Pharm.; the most frequent reason selected was that the Pharm.D. programme is more clinically-based, with patient-focused opportunities expanding for pharmacists in India (65.28%). Additionally, 37.5% of students indicated that family input heavily influenced their final decision to enrol in the programme. Figure 2a displays the proportion of all reasons selected for why the Pharm.D. programme was preferred over the B.Pharm. programme.

Figure 1: Views about career path and perceptions of Pharm.D. programme: percent agreement before and after entering Pharm.D. programme

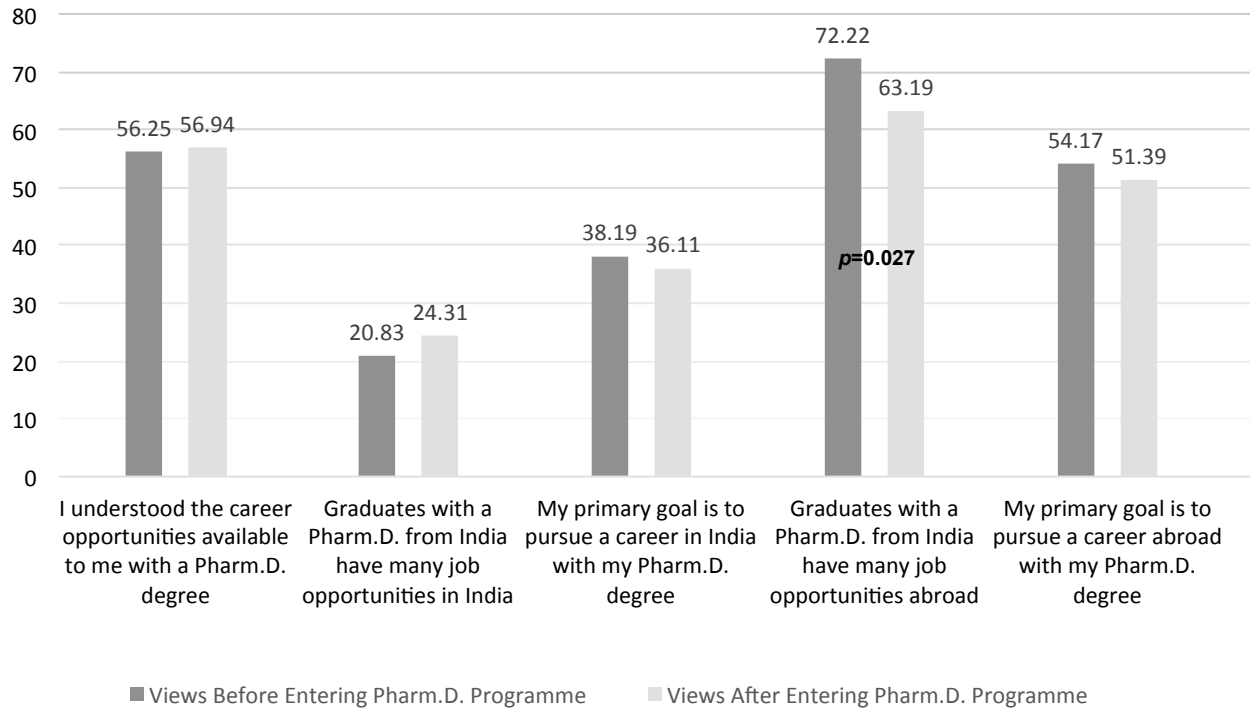

Figure 2a: All reasons why students chose Pharm.D. over B.Pharm. programme

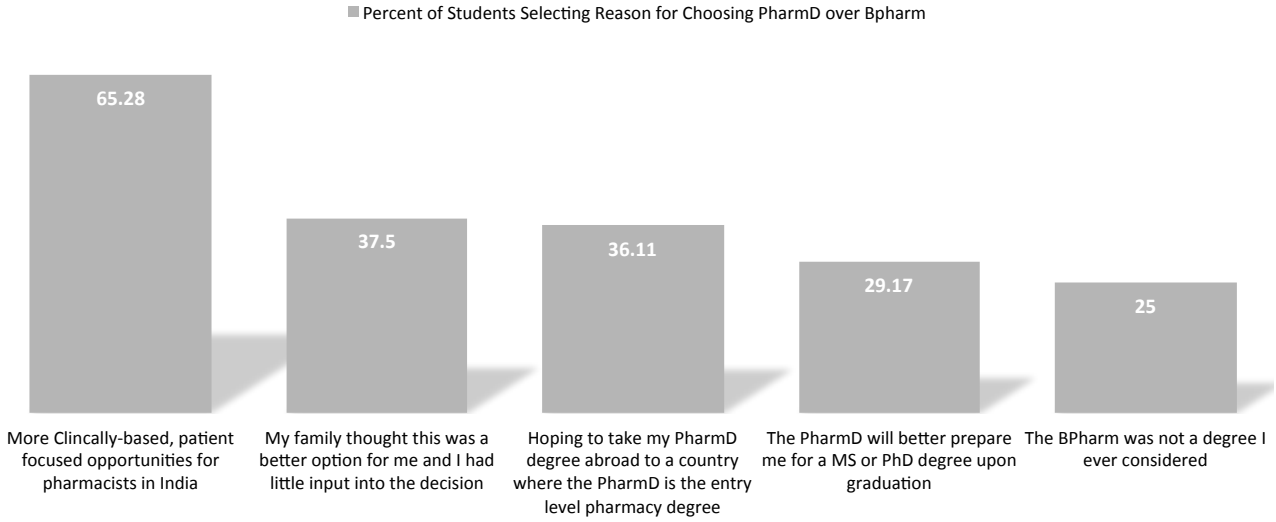

Figure 2b: Top three reasons why students chose Pharm.D. over B.Pharm. programme: percent by class

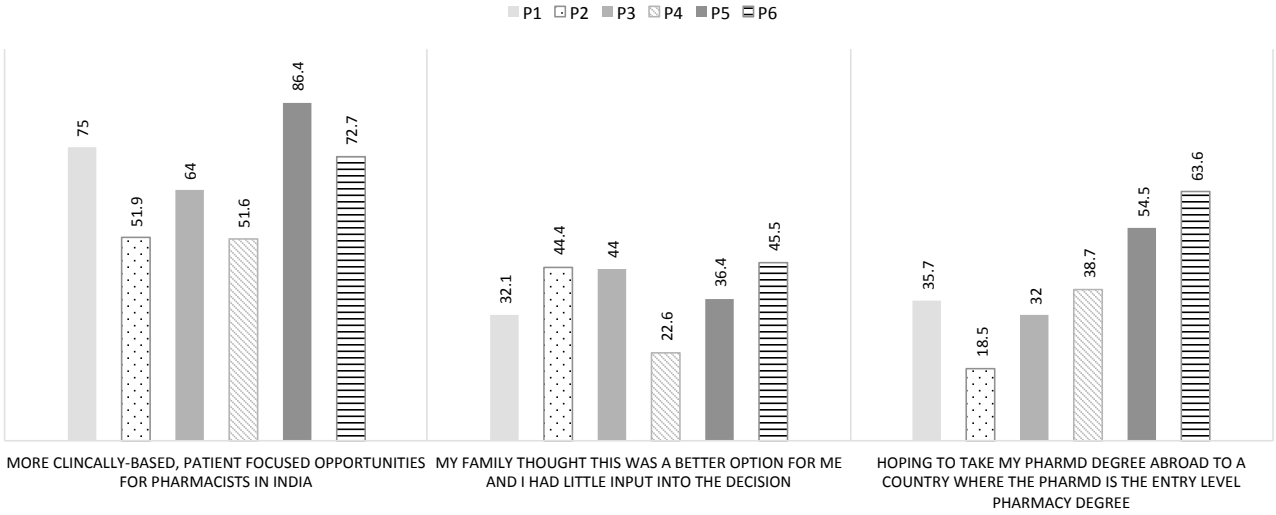

Figure 2b illustrates the top three reasons, that students chose the Pharm.D. program over the B.Pharm., broken down by class. Interestingly, a visible increasing trend was seen among each cohort regarding their hopes to take their Pharm.D. degree abroad to a country where the Pharm.D. is entry level; as graduation neared, a greater percentage of students hoped to take their Pharm.D. degree abroad.

Discussion

With the new implementation of a Pharm.D. programme in India, there is interest in better understanding the perceptions of pharmacy school training and career aspirations among Indian pharmacy students. Results of this study indicate that approximately half of students in the selected Indian Pharm.D. programme have an interest in pursuing job opportunities abroad, but as students progressed through the programme, they became more aware of the limited opportunities in those countries. Additionally, students further along in the programme demonstrated a stronger desire to take their Pharm.D. abroad, while students newer to the programme expressed less desire to go abroad, possibly due to their increased knowledge of expanding opportunities within the country. Post-graduation data demonstrated that less than a third of graduates over the last three years actually travelled abroad. Graduates may choose to remain in country due to the awareness of expanding clinical opportunities in India, family influences, and the increased awareness of the challenges to pursue licensure and employment abroad.

Since the inception of the Pharm.D. programme in India, job opportunities for Indian-trained Pharm.D. graduates have slowly expanded throughout India (Deshpande *et al*., 2015). Opportunities continue to develop as a result of outsourcing and the creation of new positions in

medical transcription, forensic pharmacy, clinical research and development, medical writing, and pharmacovigilance (Deshpande *et al*., 2015). Additionally, with the expansion of Pharm.D. programmes in India, faculty appointments have also been created in these new programmes. These new and expanding opportunities provide niche positions for the Pharm.D. graduates (Deshpande *et al*., 2015). Data acquired in this study, for the most recent graduating year (n=28), demonstrated that 53.6% of graduates actually acquired positions using their Pharm.D. degrees within India.

Graduates may find themselves torn between pursuing their pharmacy career abroad and juggling family or fiscal responsibilities at home. With Indian culture having a strong commitment to family responsibilities, graduates may opt to remain local to support families or until marriages have been arranged. Data from this study demonstrated that family influence played a vital role in the student's decision to pursue the Pharm.D. programme. Family influence within India has been known to have an impact on career decisions across many disciplines (Fouad, 2016).

For those graduates who decide to pursue careers abroad, obtaining the necessary travel documentation and work visas may be challenging. Graduates of Indian schools of pharmacy have historically pursued licensure and job opportunities in the United Kingdom, Australia, New Zealand, Canada and the U.S., among others (Businesswire, 2016). Over the years, a significant number of Indian pharmacy graduates have migrated to the U.S. (NABP, 2016).

Graduates with the intent to secure licensure and a career as a pharmacist in the U.S. will need to successfully complete a series of examinations prior to job application. Graduates must take the Test of English as a Foreign Language Internet-Based Test (TOEFL iBT), the Foreign Pharmacy Graduate Equivalency Examination (FPGEE), the North American Pharmacist Licensure Examination (NAPLEX) and the Multistate Jurisprudence Pharmacy Examination (MJPE) depending on state requirements (National Association of Boards of Pharmacy, 2016a; 2016b). Additionally, state boards of pharmacy will require between 500 - 1,500 internship hours before licensure. These requirements will necessitate the graduate to be in the U.S. for approximately one - two years to complete these requirements before licensure. Additionally the applicant must navigate the U.S. immigration system to acquire appropriate visas for entering the U.S. All of these requirements may create barriers that influence the graduate's decisions to travel abroad.

Data provided by the NABP indicates that 3,557 Indian applicants have successfully completed the FPGEE since 2008 (Table II). Of note, the number of applicants has decreased steadily over this time period. Possible explanations could be a decrease in the number of available pharmacist positions in the U.S., or a decrease in the number of applicants with the necessary credentials. Between 2008 and 2014, graduates of Indian pharmacy schools typically held a B.Pharm. plus an M.Pharm. degree, while after 2014, the Pharm.D. degree was the more common credential. The FPGEE data indicates higher pass rates since 2014; this pattern may coincide with influx of graduates of the newly established Pharm.D. programmes in India and reflect the better clinical preparation afforded to students in the Indian Pharm.D. curriculum.

Table II. FPGEE Pass Rates for Indian Applicants by Year (NABP, 2016)

Year	Pass Rate	Total Testing	Comments
2008	40.8%	933	
2009	44.1%	617	
2010	36.3%	539	
2011	44.1%	558	
2012	36.9%	284	Implementation of 5 attempt policy
2013	42.9%	184	First graduates of continuous 6 year Pharm.D. began testing- not all examinees were graduates of the Pharm.D. programme
2014	53.7%	162	
2015	54.8%	135	
2016	62.1%	145	

Overall, students in the Indian Pharm.D. programme from this study appear to be more aware of their career opportunities both locally and abroad. Additionally, for these students, their interest in working in clinically-based settings, family influences, and challenges related to working abroad may have impacted their preferred career trajectory. Further studies exploring the interests, challenges, and professional paths among Indian pharmacy students will be important in providing foundational programmes and career guidance to aspiring Indian Pharm.D. students.

Strengths and Limitations

Strengths of this study include the responses from all pharmacy cohorts (P1-P6), ensuring broad representation of perspective. Additionally, prior to the study, survey questions were vetted and approved by faculty at the Indian institution. Finally, students had much better understanding of clinical pharmacy due to the U.S. faculty member's presentation on pharmacy education and clinical practice in the U.S., which allowed for additional insight prior to completing the survey.

Limitations of this study include the possible coercion of students to complete the survey due to being asked while being present in their classroom; however, this study was presented as optional and not all students completed it. For those students who did complete the survey, it is not likely that their answers regarding perceptions of the

pharmacy programme, or their career intentions, would change. Also, this is a quasi "before and after" study with students' views for both time points being captured at one point in time. Students were asked to answer the same set of questions after being enrolled in the programme, but reflecting on their feelings both pre- and post-programme enrolment, resulting in potentially altered perception data. Finally, this is a survey from one pharmacy school in India, and results may not be generalisable to other Pharm.D. students.

Conclusions

Although the Pharm.D. course was launched in India in 2008, there is still a large knowledge deficit among healthcare professionals, government, and the general population about the services that Pharm.D. graduates can provide (Jishnu *et al*., 2011). Current lack of awareness about the Pharm.D. programme has resulted in a slowing or stagnation in the creation of clinical job opportunities for Indian Pharm.D. graduates (Jishnu *et al*., 2011). It is therefore an opportunity for schools of pharmacy and graduates of the Indian Pharm.D. programmes to advocate for the profession and for opportunities for clinical pharmacy. As clinical pharmacy in India continues to evolve, there is the potential for the creation and implementation of clinical pharmacist positions in various settings such as primary care, acute inpatient care, long-term care, and services specialising in oncology, cardiology, neurology, infectious disease, and solid organ transplants; this is consistent with what is seen in western countries. As medical providers continue to learn of the pharmacotherapy contributions that Pharm.D. graduates can provide to their clinical practice, clinical pharmacy services have the ability to gain momentum as an emerging healthcare profession. Much can still be accomplished by vested parties such as the Indian government and the healthcare profession at large to address the need and place for clinical pharmacists in all areas of healthcare.

Although clinical-based opportunities for Pharm.D. graduates continue to expand throughout India, this study showed that more than half of the students surveyed expressed a desire to take their degree abroad. With the known challenges associated with licensure abroad and the increased clinical opportunities within the country, this establishes the need for Indian pharmacy schools to provide career awareness to the upcoming generation of pharmacy students.

On a cultural level, there may also be an inherent push for Indian students to pursue the Pharm.D. degree. Apart from a professional goal to secure a higher academic standard and intellectually challenging career on a personal level, there might be a perception that acquiring an advanced degree such as this would help elevate one to a higher socio-economic status, resulting in better societal standing and marital prospects. As a result, more students may consider this doctoral degree when evaluating career options.

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