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Pharmacy students' initial career choices versus subsequent career paths: a cross-sectional study

Roy Kanbar¹, Aline H. Saad² and Imad F. Btaiche^{3*}

Abstract

Background The pharmacy profession offers diverse career paths. Yet, pharmacy students may not be familiar with these various paths and may struggle to choose one that is best suited to their interests, goals, and values. Limited literature has reported on pharmacy students' career interests. However, no studies have evaluated pharmacy graduates' eventual career paths as compared to their initial choices when they were students. Therefore, the primary objective of this study was to compare pharmacy students' initial career choices to their subsequent career paths.

Methods This was a descriptive cross-sectional study that analyzed data on pharmacy students' initial career choices when they were enrolled in a career opportunities course and their subsequent career paths following graduation. Data on the initial career choices of students were retrospectively collected from the records of a career opportunities elective course between the academic years 2012 and 2019. Based on previous employment surveys, data on the subsequent graduates' career paths and graduate and postgraduate education were retrieved from the school records. Subsequent graduates' career paths were then compared to their individual students' initial career choices. The paths of graduates with a Doctor of Pharmacy (PharmD) versus Bachelor of Science in Pharmacy (BS Pharm) only holders were analyzed.

Results The overall subsequent career paths of graduates matched the initial students' career choices in 30.8% of cases. While the top initial students' career choices were community pharmacy (36.1%), clinical pharmacy (31.4%), and pharmaceutical industry (12.9%), the top subsequent graduates' career paths were however the pharmaceutical industry (30.7%), community pharmacy (17.9%), and clinical pharmacy (7.9%). Work in the pharmaceutical industry and community pharmacy and the pursuit of masters and/or PhD were mostly followed by BS Pharm graduates, whereas PharmD holders predominantly pursued clinical pharmacy.

Conclusions Pharmacy graduates' career paths infrequently matched their initial career choices as students. Pharmacy curricula should prepare students for diverse career paths.

Keywords Pharmacy students, Career paths

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Background

Pharmacy students are presented with diverse career options in various practice areas and specialty roles [1–3]. Despite the ample choices, pharmacy students find it difficult to decide on a career path that best matches their aspirations, interests, and goals. Only a few reports in the literature from different countries have described pharmacy students' career preferences [1–4]. In an earlier survey from 2004 of 509 students from 8 U.S. pharmacy schools, about two-thirds of students aspired to a career in direct patient care settings while the rest aimed at careers in indirect patient care and drug distribution [1]. In a more recent survey from 2023 of 454 pharmacy interns with the majority enrolled in the PharmD programs at 25 pharmacy colleges in Saudi Arabia, students' primary interest was clinical pharmacy followed by the pharmaceutical industry [2]. This is in contrast to an earlier study from 2019 in Saudi Arabia which reported that pharmacy students' first choice was hospital pharmacy, followed by academia and research, while community and industrial pharmacy were the least chosen [4]. In a 2022 report from one pharmacy school in Lebanon, about two-thirds of surveyed students initially considered community or hospital pharmacy, and 60% academic pharmacy [3].

When considering the available data on pharmacy students' career interests, they diverge depending on the geographical location and study design. Such interests are also influenced by different factors such as personal interests, curriculum, experiential learning experiences, financial incentives, job availability, career ladder, and flexible working hours [1–4]. While the available studies reported on pharmacy students' career interests, none followed up on how students' initial career choices corresponded to their actual career paths. Hence, the primary objective of this study was to compare pharmacy students' initial career choices to their subsequent career paths after they graduated from the program.

Methods

Study setting

The School of Pharmacy at the Lebanese American University (LAU) is located in Byblos, Lebanon. It offers a Bachelor of Science in Pharmacy (BS Pharm) degree program that spans 5 years (174 credits) of study and a Doctor of Pharmacy (PharmD) degree that spans 6 years (201 credits). Students can graduate from the program with a BS Pharm which allows them to apply for pharmacist's registration and become licensed practicing pharmacists in Lebanon, or can proceed for their sixth year to complete their PharmD requirements. On average, about 45% of the BS Pharm class pursues the PharmD year (professional year 4) which consists of the advanced pharmacy practice experiences (APPEs) conducted in Lebanon and

the U.S. with a primary focus on clinical practice and patient care. The LAU PharmD program is accredited by the Accreditation Council for Pharmacy Education (ACPE).

The school provides a 1-credit elective course on career opportunities to second- and third-year professional students (i.e., fourth- and fifth-year students in the pharmacy program, respectively) to increase students' awareness by providing them with guidance on the different career paths. The course includes individual and group assignments on various career and professional topics. One of the course assignments requires that each student write their own career vision by identifying their career of choice and anchoring their interests, goals, values, passion, competencies, strengths, and weaknesses with a plan for realizing their goal. Details of the course have been published elsewhere [5].

Study design

This was a cross-sectional study that followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines [6]. The study included students who were enrolled in the career opportunities course between academic years 2012 and 2019. Data on the initial career choices of students when they were enrolled in the career opportunities course were retrospectively collected from the course records. Collected data were stratified based on students' last terminal degree (i.e., BS Pharm vs. PharmD) upon exiting the school of pharmacy. Information on the subsequent graduates' career paths and graduate or postgraduate education was also retrospectively retrieved from the school records. These data are regularly collected by the school one year after students' graduation using telephone and email surveys (Supplementary file).

Data management and analysis

Data were entered and tabulated on an Excel spreadsheet and analyzed in Microsoft Excel 2016®. Security codes were assigned to computerized records and codes were used to replace names in order to conceal the identity of the participants. Only the study investigators had access to the identifiable data. Subsequent graduates' career paths were compared to their respective initial career choices identified by students in the career opportunities course. The paths of graduates with a PharmD versus BS Pharm only were also compared. Descriptive statistics were used. The Institutional Review Board (IRB) of LAU approved the study. Human Ethics were followed and consent to participate was not required by IRB which determined the study to be exempt from IRB review. All records are kept confidential with access to the data limited only to the investigators. Data documents are stored

Table 1 Matching of graduates' subsequent career paths to the initial career choices (N = 280)

Career options	Initial career choice of students: number (percent)	Subsequent career path of graduates: number (percent)	Matched career path to initial choice: number (percent)
Community pharmacy	101 (36%)	50 (17.9%)	33 (11.8%)
Clinical pharmacy	88 (31.4%)	22 (7.9%)	15 (5.4%)
Pharmaceutical industry	36 (12.9%)	86 (30.7%)	21 (7.5%)
Academia	2 (0.7%)	-	-
Consultant pharmacy	-	3 (1.1%)	-
Hospital pharmacy	1 (0.4%)	9 (3.2%)	-
Governmental/regulatory affairs	-	4 (1.4%)	-
Research associate/ coordinator	1 (0.4%)	8 (2.9%)	-
Graduate/postgraduate education			
Masters and/or PhD	49 (17.5%)	31 (11.1%)	17 (6.1%)
Other	2 (0.7%)	-	

within locked locations and with restricted access to the investigators only.

The data were entered into SPSS® (IBM SPSS Statistics Version 27) for statistical analysis. A Chi-Square test was used to assess the association between the career choices and the subsequent career paths and graduate and postgraduate education. The significance level was set at $p < 0.05$ allowing to determine whether there were statistically significant differences in career distribution between the BS Pharm and PharmD graduates.

Results

Career paths

A total of 280 students were enrolled in the career opportunities course during the study period. During that period, a total of 430 students graduated from the school with a BS Pharm of whom 204 continued to get their PharmD degree. Therefore, the number of students who were enrolled in the course corresponds to about 65% of the graduating student population. Of these, 109 (38.9%) graduated with a PharmD and 171 (61.1%) with a BS Pharm only. Employment data could not be identified on 66 (23.6%) of the graduates, therefore leaving data available on 214 (76.4%) graduates' subsequent career paths (Table 1).

For the top initial students' career choices, 101 (36%) selected community pharmacy, 88 (31.4%) clinical pharmacy, and 36 (12.9%) pharmaceutical industry (i.e., product specialist, quality assurance; medical representative; regulatory affairs; brand and marketing manager; drug safety; medical information). For the top subsequent graduates' career paths and out of the 280 students enrolled, 86 (30.7%) worked in the pharmaceutical industry, 50 (17.9%) in community pharmacy, and 22 (7.9%) in clinical pharmacy. When the matching of all of the corresponding career paths to the initial career choices was analyzed, 86 (30.8%) in total matched. These included 33

Table 2 Career paths of doctor of pharmacy (PharmD) versus bachelor of Science in Pharmacy (BS Pharm) only holders.*

Career options	Subsequent career path: number (percent)	Matched career path: number (percent)
Community pharmacy	21 (42%) PharmD 29 (58%) BS Pharm	9 (27.3%) PharmD 24 (72.7%) BS Pharm
Clinical pharmacy	18 (81.8%) PharmD 4 (18.2%) BS Pharm	14 (93.3%) PharmD 1 (6.7%) BS Pharm
Pharmaceutical industry	25 (29.1%) PharmD 61 (70.9%) BS Pharm	6 (28.6%) PharmD 15 (71.4%) BS Pharm

*These exclude graduate and postgraduate education

(11.8%) graduates who matched for community pharmacy, 21 (7.5%) for the pharmaceutical industry, and 15 (5.4%) for clinical pharmacy (Table 1).

The breakdown analysis of the career paths of PharmD and BS Pharm holders, irrespective of their initial career choices showed the following, respectively: community pharmacy 21 (42%) and 29 (58%), clinical pharmacy 18 (81.8%) and 4 (18.2%), and pharmaceutical industry 25 (29.1%) and 61 (70.9%). The matched career paths to the initial choices of the PharmD and BS Pharm holders showed the following, respectively: community pharmacy 9 (27.3%) and 24 (72.7%), clinical pharmacy 14 (93.3%) and 1 (6.7%), and pharmaceutical industry 6 (28.6%) and 15 (71.4%) (Table 2). The Chi-square test results showed a statistically significant association between career choices and paths based on the terminal degree ($p = 0.008$).

Graduate and postgraduate education

The initial career choice and subsequent pursuit of graduate and postgraduate education (i.e., masters, PhD) were analyzed. In total, 49 (17.5%) students initially considered graduate and/or postgraduate education. Of these, 31 (11.1%) graduates ended up pursuing masters and/or PhD. Of those who pursued masters and/or PhD,

Table 3 Matching of students' initial graduate and postgraduate education choices to subsequent career paths

Graduate/postgraduate education (MS and/or PhD)	Initial graduate/ postgraduate choice: number (percent)	Subsequent graduate/ postgraduate path: number (percent)	Matched of the path to initial choice: number (percent)
Total number of students (PharmD and BS Pharm)	49 (17.5%)	31 (11.1%)	17 (6.1%)
PharmD students		8 (25.8%) PharmD	4 (23.5%) PharmD
BS Pharm students		23 (74.2%) BS Pharm	13 (76.5%) BS Pharm

8 (25.8%) had a PharmD, and 23 (74.2%) had a BS Pharm only. When the subsequent career paths were compared to the initial career choices, 17 (6.1%) graduates matched with their initial masters and/or PhD choice of whom 4 (23.5%) had a PharmD and 13 (76.5%) had a BS Pharm (Table 3).

The results of the Chi-Square test showed a statistically significant association between career choice and subsequent pursuit of graduate and postgraduate education ($p=0.031$). A higher proportion of BS Pharm as compared to PharmD graduates pursued graduate and postgraduate education (Table 3).

Discussion

The decision to pursue pharmacy education is driven by several factors, including personal preference; a desire to improve public health; the influence of family, friends, and educators; income; flexible work hours; and work opportunities [3]. Factors that influence the career aspirations of pharmacy students include income, benefits, stress level, handling multiple tasks, self-actualization, job position flexibility, additional training required, applying knowledge, unique focus, patient care, managerial responsibility, and work schedule flexibility [1–4].

Career paths

In our study, the top initial choice of students for community pharmacy echoes what was recently reported in a survey of pharmacy students' perspectives on pharmacy education and career aspirations at one school in Lebanon whereby 68% of students were considering community pharmacy [3]. This top-ranked initial choice by students can be explained by several factors that could have influenced their choices. These can include students' prior exposure to community pharmacy practice experiences that occur early in the curriculum, the public visibility of the community sector as the traditional practice setting of pharmacists, in addition to the entrepreneurship and business appeals of this practice model with the possibility of independent pharmacy ownership. Yet, a lower number of graduates landed in community pharmacy than initially considered. While several factors affect one's career path, the labor market plays a significant role in this case. The surplus of community pharmacies and their financial hardships due to Lebanon's

economic and financial crises are considerable factors [7–9]. The findings of a recent study that assessed pharmacy graduates' career choices in Lebanon further support the interpretation of our study results. In that study, although most pharmacy graduates have worked in a community pharmacy, more than one-half of them did not consider it their preferred career path and expressed dissatisfaction with the financial compensation, stress, and heavy workload [10]. Job dissatisfaction among community-based pharmacists has also been reported in the U.S. for reasons of high workload, work environments, and stress [11, 12].

A top match of our pharmacy graduates' career paths was the pharmaceutical industry. This is one of the historically dominant sectors where pharmacists work in Lebanon [7, 13]. Pharmacy graduates in Lebanon who join the pharmaceutical industry mostly work as medical representatives in local and global pharmaceutical companies [14]. The pharmaceutical industry is particularly appealing to pharmacy graduates considering the variety of opportunities that it offers with attractive salaries and incentives [2].

While one-third of our students initially considered clinical pharmacy as a career, only a few of them ended up working as clinical pharmacists. The considerable shift of pharmacy curricula in the country, including our school's program, to emphasize the clinical sciences and patient care may have sparked initial students' interest in clinical pharmacy practice [14]. Such interest has been reported by students at other pharmacy schools in the region [2]. Yet, the low match of career paths in clinical pharmacy to the initial choice is likely due to the limited number of postgraduate pharmacy residency programs in the country that typically prepare graduates for such a role, in addition to the lack of job opportunities for clinical pharmacists in Lebanon. Considering the significant association between career choices and paths based on the terminal degree, this suggests that the distribution of career paths among PharmD and BS Pharm graduates was not due to random chance. The vast majority of those who worked in clinical pharmacy were PharmD graduates as compared to BS Pharm only holders. Conversely, a larger percentage of BS Pharm graduates ended up working in the pharmaceutical industry and community pharmacy. This observation is in agreement with the

findings of a recent study whereby fresh PharmD graduates in Lebanon mostly worked in hospitals rather than in other sectors such as medical representatives that were predominantly pursued by BS Pharm holders [10].

Overall, the subsequent career paths of graduates matched their initial career choices in a little less than one-third of cases. The relatively high mismatch between initial students' career choices and subsequent graduates' career paths is likely influenced by many factors of personal and professional natures. The limited work opportunities and narrow scope of pharmacy practice in Lebanon remain the foremost factors that hinder pharmacy graduates' in pursuing their career aspirations.

Graduate and postgraduate education

The study findings show a drop in the subsequent pursuit of masters and/or PhD than initially considered with a larger proportion of BS Pharm only graduates, as compared to PharmD holders, pursuing these paths. Yet, these selections based on terminal degree holding were not arbitrary but rather based on an envisioned career path, albeit could have changed as students progressed in the didactic and experiential curricula. In the career opportunities course, graduate and postgraduate education is emphasized in a didactic lecture, students' career vision writing, group presentations on graduate and/or postgraduate programs, as well as in mock interviews [5]. Furthermore, faculty's possible influence on these choices early in the course of study, especially in the foundational sciences that are primarily taught by PhD holders, could have affected students' initial choices. Despite the availability of graduate MS programs available at local universities to pharmacy graduates, a PhD is an uncommon pathway that is primarily considered by those who intend to work in academia and research [15]. Of note, graduates who intend to pursue masters and/or PhD also seek these programs abroad for the broader choices and opportunities they present.

In Lebanon, a 5-year pharmacy education with a BS Pharm remains the official educational requirement to become a licensed pharmacist and the PharmD is optional. While PharmD graduates appear to have obvious interest in clinical work, BS Pharm only holders interest appear to lie in community and industrial pharmacy with the latter favoring an upgrade of education and skills through graduate programs. This could explain the reason for the larger percentage of BS Pharm graduates who pursued graduate studies. These choices, although they could change throughout the program as students gain more exposure and experience in the curriculum, appear to mostly follow a certain trajectory that yields to the favored and convenient career path.

Study limitations

Limitations of this study include missing data on the subsequent career paths of 23.6% of graduates. Another limitation is that data were derived from the sample of second- and third-professional year students at one program who were specifically enrolled in the career opportunities elective course. At this stage, there is still students' ongoing exposure to areas of pharmacy practice in the program which can change their earlier vision and ultimate decision about their subsequent career paths. Furthermore, the labor market is a major determining factor in the selection of career paths, and the job opportunities are different between countries which limits the generalizability of our results. Although not generalizable, our overall study findings may still apply to graduates of certain schools and colleges of pharmacy according to different geographical locations and available work opportunities.

Conclusions

The pharmacy profession offers a variety of career opportunities. While pharmacy students' initial career choices are based on their personal and professional goals, interests, and perceptions, their subsequent career paths are not always necessarily aligned with their initial career aspirations. Considering that many factors influence one's career path, pharmacy programs should prepare students for diverse career opportunities in synchrony with the pharmacists' job market as well as the professional and societal needs and expectations of the pharmacy profession.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12909-024-06366-2>.

Supplementary Material 1

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Author contributions

R.K., A.H.S., and I.F.B., contributed to the conceptualization, data curation, design, resources, validation, visualization, writing, review, and editing of the original drafts and final manuscript. R.K. and I.F.B. contributed to the formal analysis and interpretation of data. I.F.B. oversaw the project administration.

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Data availability

Data generated or analyzed during this study are included in this published article. The data underlying this article cannot be shared publicly due to the privacy of individuals who participated in the study.

Declarations

Ethics approval and consent to participate

The Institutional Review Board (IRB) of the Lebanese American University (LAU) approved the study. Human Ethics were followed and consent to participate were not required by IRB which determined the study to be exempt from IRB review, as the data were completely de-identified and cannot be linked back to students.

Consent for publication

The authors report no conflict of interest and give their consent for publication.

Competing interests

The authors declare no competing interests.

Abbreviations

LAU: Lebanese American University.

BS Pharm: Bachelor of Science in Pharmacy.

PharmD: Doctor of Pharmacy.

ACPE: Accreditation Council for Pharmacy Education.

STROBE: Strengthening the Reporting of Observational Studies in Epidemiology.

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