

RESEARCH

Impact of Pre-Pharmacy Work Experience on Development of Professional Identity in Student Pharmacists

Timothy J. Bloom, PhD, Jennifer D. Smith, PharmD, Wesley Rich, PhD

Campbell University College of Pharmacy & Health Sciences, Buies Creek, North Carolina

Submitted November 1, 2016; accepted May 14, 2017; published December 2017.

Objective. To determine the benefit of pharmacy work experience on the development of student pharmacists' professional identity.

Methods. Students in all four professional years were surveyed using a validated Professional Self-identity Questionnaire (PSIQ). They were also asked about pharmacy experience prior to matriculation and their performance on Drug Information tests given midway through the P1 year and at the beginning of the P3 year. PSIQ responses and test results were compared based on pharmacy experience.

Results. The PSIQ was completed by 293 student pharmacists, for a 67% response rate, with 76% of respondents reporting pharmacy experience prior to matriculation. Statistically higher scores on responses to 6 of the 9 PSIQ Likert-type items were observed from students in the first professional year for those with pharmacy experience; however, only one item in the second year showed differences with none in the third and fourth years. No impact of experience was observed on Top 100 or Top 300 grades.

Conclusion. Pre-matriculation pharmacy experience may increase development of professional identity early in the student experience but may have little impact on academic readiness. Schools and colleges of pharmacy hoping to recruit students with an early sense of professional identity should consider adding such experience to their admissions requirements.

Keywords: admissions criteria, professionalism, work experience, professional identity

INTRODUCTION

The Accreditation Council for Pharmacy Education (ACPE) Standards 2016 and the 2013 Center for the Advancement of Pharmacy Education (CAPE) outcomes include increased expectations for development of student pharmacists in the affective domain.^{1,2} The Standards 2016 guidance document suggests "Admissions criteria take into account desirable qualities important to the development of the personal and professional characteristics articulated within Standard 4."³ These characteristics are self-awareness, leadership, innovation and entrepreneurship, and professionalism. In response to the new standards, pharmacy schools are exploring ways to incorporate measures of these characteristics into the application process. Self-awareness may be assessed to some extent during an interview while leadership is often assessed based on extracurricular activities and a history of taking on

leadership roles. Innovation, entrepreneurship and professionalism may be more difficult to assess in applicants.

Professionalism has been defined as "the possession and/or demonstration of structural, attitudinal and behavioral attributes of a profession and its members."⁴ Hammer and colleagues reviewed the history of professionalism in pharmacy and commented on its status in 2003.⁵ The idea of pharmacy as a profession is relatively new compared to law or medicine, due in part to its long history as a business in which medications were prepared at the request of a physician. The dichotomy of pharmacy as a business and pharmacy as a profession still exists today.

It is plausible that recognition of a professional identity, among many potential factors, serves as part of the foundation to develop the requisite attitudes and behaviors constituting professionalism. Goldie reviewed the development of professional identity in medical school curricula, noting that implicit modeling of professional behaviors in morbidity and mortality reviews or gross anatomy labs is a powerful component of developing a professional identity.⁶ Hammer and colleagues said, "In pharmacy the socialization process begins the moment a student (or potential student) observes and interacts with

Corresponding Author: Wesley D. Rich, Campbell University College of Pharmacy & Health Sciences, PO Box 1090, Buies Creek, NC, 27506. Tel: 910-893-1892. Fax: 910-893-1697. E-mail: richw@campbell.edu

pharmacists, evaluates what they do, or actively seeks information about the profession. Beliefs, attitudes and behaviors begin to develop with regard to pharmacists' roles."⁵

Noble and colleagues observed that development of professional identity in student pharmacists is difficult due in part to the broad range of pharmacists' roles.⁷ They used an ethnographic approach to study the culture of a pharmacy program, with one author making field observations while embedded in courses over the period of a month and interacting with students as they went through their normal program-based activities, including classes and labs. One of their findings was that many clinical faculty were seen by students as educators rather than as pharmacists, so the opportunity to develop their own professional identity from interactions with these clinical faculty was minimized. Taylor and Harding reported a similar phenomenon, finding that students considered their clinical faculty to be educators rather than pharmacist role models and that they did not begin to describe themselves as members of the profession until after their first didactic year, which was heavy in the science foundation but limited in clinical-related experiences.⁸

A review of the admissions requirements posted on the American Association of Colleges of Pharmacy (AACCP) website (accessed March 3, 2016) showed that of the 133 accredited schools and colleges of pharmacy, only five had a requirement for pharmacy-related work experience. The definition of experience ranged broadly among these schools, with the least stringent being 8 hours of shadowing a practicing pharmacist. Of the remaining 128 schools, 13 explicitly stated that no experience was needed while 115 recommended but did not require such experience. The justification at many schools for recommending experience was to enhance applicants' knowledge and understanding of the health care system, but exposure to the professional behavior of pharmacists and the development of professional identity was not mentioned. In numerous cases, any type of health care experience was described as acceptable.

As with other admissions criteria, there is little consistency in the literature regarding the benefit of pharmacy experience on academic success in Doctor of Pharmacy programs.⁹⁻¹² It may be that the benefit of pre-professional pharmacy experience lies in non-cognitive areas. This study describes the use of a validated Professional Self-Identity Questionnaire (PSIQ) to determine whether previous pharmacy work experience before matriculation is related to a stronger sense of professional identity in student pharmacists. Crossley and Vivekananda-Schmidt previously used the PSIQ to compare the professional identity of student doctors based on pre-program

experience.¹³ The authors reported that student doctors reporting pre-matriculation experience posted higher overall scores on the PSIQ.

This study secondarily aimed to assess perceptions of professional identity among student pharmacists enrolled in all four years of the professional curriculum. Lastly, this study sought to determine if there was a relationship between previous pharmacy work experience and academic achievement as measured by performance on the Top 100 and Top 300 examinations, administered during the first and third professional year, respectively. These examinations require student pharmacists to demonstrate detailed drug knowledge of the 100 and 300 most prescribed medications.

METHODS

Student pharmacists enrolled in all four professional years during the spring of 2016 were invited to complete the PSIQ along with demographic questions related to gender, age, Top 100 and Top 300 examination scores and pharmacy work experience prior to matriculation into the PharmD program at Campbell University. All data were self-reported by the study participants. This study was reviewed and approved by the Campbell University IRB.

The PSIQ was originally developed to measure professional identity in health professions students. Validated on a sample of 496 medical students across multiple phases of their education, the cross-sectional study reported nine items loaded onto three factor structures to include "interpersonal tasks" (conducting assessments, using records, dealing with emergencies and teaching), "generic attributes" (cultural awareness, ethical awareness and reflection), and "profession-specific elements" (teamwork and communication). The authors reported an overall internal reliability (Cronbach's alpha) of 0.93.¹³

Independent sample *t*-tests were used to determine if there were statistically significant differences observed on each of the nine items measured by the PSIQ as well as scores for the Top 100 and Top 300 examinations between student pharmacists reporting previous pharmacy experience and those with none. Differences between gender and scores on the PSIQ were also compared using independent sample *t*-tests. Associations between gender and previous pharmacy experience were examined by Chi-square analysis and odds ratios are reported. Internal reliability of the PSIQ is reported as Cronbach's alpha. All data analysis was conducted using SPSS (Released 2010. IBM SPSS Statistics for Windows, Version 19.0. Armonk, NY: IBM Corp.) with significance set at $p < .05$.

RESULTS

The PSIQ, demographic questions, and requests for self-reported Top 100 and 300 scores were completed by 293 student pharmacists, 67% of the 440 enrolled in the PharmD program. The reliability of the PSIQ was $\alpha=0.822$. Of the respondents, 35% were male and 65% were female, similar to AACP's 2015 vital statistics data on national pharmacy student population. Previous pharmacy experience prior to matriculation was reported by 76% of respondents, with females being more likely to report having previous pharmacy experience, OR=1.8, 95% CI (1.1-3.2). Nineteen students reported only pharmacy-related shadow or volunteer experience prior to pharmacy school, completing on average 19 weeks (range: 1 week to 2 years). Of the 204 students reporting paid pharmacy-related work experience, 187 provided a duration of work experience with 86% reporting at least 1 year of experience prior to pharmacy school.

No significant differences were detected for the scores (expressed as percentage correct) on the Top 100 and Top 300 examinations when compared by previous pharmacy experience. Top 100 Scores for those with previous experience (90 (18.5)) and those without (85.45 (19.45)) were not found to be statistically different. Likewise, scores on the Top 300 examination for students with previous experience (92.1 (8.1)) and those without (92.0 (7.0)) were not statistically different.

The resulting data from the independent sample *t*-test of PSIQ responses can be found in Table 1. Significant differences in PSIQ responses were observed in the first professional year, with higher scores from those with pre-matriculation pharmacy experience on items related to teamwork, communications, using records, dealing with emergencies, reflection, and teaching. In the second professional year, the only item found to still be statistically different based on previous experience was communication. No differences based on previous pharmacy experience were found to be significant in the third or fourth professional years.

Independent sample *t*-tests were conducted to compare items on the PSIQ based on self-reported gender. When all professional years were combined, females scored lower on two items. There was a significant difference in scores for ethical awareness between male (4.7(0.9)) and female student pharmacists (4.4 (1.0)); $t(291) = 2.48$, $p=.014$. Differences were also observed between males (3.3(1.2)) and females (2.9 (1.3)); $t(291) = 2.48$, $p=.013$ regarding dealing with emergencies.

DISCUSSION

This study tested the hypothesis that pharmacy work experience prior to matriculation into pharmacy school

creates a stronger sense of professional identity. The PSIQ was selected for this study based on validation among medical students and the strong reliability initially reported.¹³ This questionnaire was developed based on nine common themes related to professionalism identified in curricular benchmarking documents for several health care professions, including allopathic physicians, nurses and physiotherapists.

In this cross-sectional study, perceptions of student pharmacists' professional identity were measured in each of the four years of the program during spring 2016. However, significant impact of previous pharmacy experience was only observed for students enrolled in the first and second years of the curriculum with the majority of statistical significance noted in first year students. Students in the first year of the curriculum, who reported previous pharmacy experience, rated themselves higher on 6 of the 9 questions related to professional identity; however, students in the second year of the curriculum who reported previous pharmacy experience only rated themselves higher on 1 of the 9 questions. No impact of pre-matriculation pharmacy experience was observed in the third and fourth year students. Therefore it is plausible that the pharmacy experiences provided through the curriculum and co-curriculum aided in the development of professional identity over the course of the first two years in those students without previous pharmacy experience. Thus, prior pharmacy-related experience appears to facilitate earlier development of professional identity, including in non-cognitive aspects such as communication, reflection, and teamwork. Prior pharmacy experience can provide insight into the expectations as well as behavioral and cultural norms of the profession of pharmacy, which may allow for enhanced learning experiences early in the curriculum. If professional identity could be developed through pharmacy experiences prior to matriculation, efforts by schools and colleges of pharmacy to initially develop this identity could be refocused into other areas. It should be noted that other work has shown that early development of professional identity has been associated with enhanced motivation, confidence, and successful transitions into the work environment.¹⁴

The development of professional identity is influenced by professional socialization, which is the acquisition of the expectations, skills, behaviors, and performance demands of the profession.¹⁵ Others have demonstrated that role models and mentors are instrumental in the development of professional identity across multiple disciplines.^{6,14,15} Thus, as pharmacy continues to move from a product-based business to a patient-care focused profession, it could be speculated that early exposure to pharmacy role models and mentors even through multiple shadowing

Table 1. PSIQ Mean^a by Professional Year

		P1	P2	P3	P4	All Years Combined
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Teamwork	Overall	3.4 (1.2)	3.5 (0.9)	3.7 (0.9)	4.7 (0.5)	3.6 (1.1)
	Previous Pharmacy Experience	3.6 (1.1) *	3.5 (1.0)	3.6 (1.0)	4.7 (0.5)	3.7 (1.0)
	No Previous Experience	2.9 (1.4)	3.4 (0.1)	4.1 (0.7)	4.3 (0.6)	3.5 (1.1)
Communication	Overall	3.5 (1.3)	3.9 (1.0)	3.9 (0.9)	5.0 (0.3)	3.8 (1.1)
	Previous Pharmacy Experience	3.6 (1.2)*	4.0 (1.0)*	3.8 (0.9)	5.00 (0.0)	3.9 (1.1)*
	No Previous Experience	3.0 (1.2)	3.4 (1.1)	4.1 (0.9)	4.7 (0.6)	3.5 (1.2)
Conducting Assessments	Overall	3.0 (1.2)	3.3 (1.0)	3.6 (0.9)	4.9 (0.3)	3.4 (1.1)
	Previous Pharmacy Experience	3.0 (1.2)	3.3 (1.0)	3.6 (0.9)	4.9 (0.3)	3.4 (1.1)
	No Previous Experience	2.8 (1.1)	3.2 (1.0)	3.8 (1.0)	4.8 (0.5)	3.3 (1.1)
Cultural Awareness	Overall	3.7 (1.1)	4.0 (1.1)	4.0 (1.0)	4.9 (0.4)	4.0 (1.1)
	Previous Pharmacy Experience	3.8 (1.1)	4.0 (1.1)	4.1 (1.0)	4.8 (0.4)	4.0 (1.1)
	No Previous Experience	3.4 (1.2)	4.0 (1.0)	4.00 (1.2)	5.0 (0.0)	3.83 (1.11)
Ethical Awareness	Overall	4.2 (1.0)	4.6 (1.0)	4.9 (0.9)	4.8 (0.4)	4.5 (1.0)
	Previous Pharmacy Experience	4.2 (1.0)	4.6 (1.1)	5.0 (0.9)	4.9 (0.4)	4.5 (1.0)
	No Previous Experience	4.3 (0.9)	4.6 (1.0)	4.7 (0.8)	4.7 (0.6)	4.5 (1.0)
Using Records	Overall	3.5 (1.4)	3.9 (1.2)	4.0 (1.0)	5.0 (0.4)	3.9 (1.2)
	Previous Pharmacy Experience	3.7 (1.4) **	4.0 (1.2)	4.0 (1.0)	4.8 (0.4)	4.0 (1.2)*
	No Previous Experience	2.6 (1.4)	3.5 (0.9)	4.1 (0.8)	4.3 (0.6)	3.4 (1.2)
Dealing with Emergencies	Overall	2.8 (1.3)	2.8 (1.2)	3.2 (1.2)	4.3 (0.9)	3.0 (1.3)
	Previous Pharmacy Experience	2.9 (1.3)*	2.8 (1.2)	3.1 (1.1)	4.4 (0.9)	3.1 (1.3)
	No Previous Experience	2.2 (1.1)	2.7 (1.2)	3.4 (1.2)	3.7 (1.5)	2.8 (1.2)
Reflection	Overall	3.5 (1.3)	3.8 (1.1)	4.0 (1.0)	4.8 (0.4)	3.8 (1.1)
	Previous Pharmacy Experience	3.7 (1.1)**	3.9 (1.0)	3.9 (1.1)	4.8 (0.4)	3.9 (1.0)**
	No Previous Experience	2.9 (1.7)	3.5 (1.3)	4.0 (0.7)	4.3 (0.6)	3.5 (1.4)
Teaching	Overall	3.9 (1.5)	3.8 (1.1)	4.0 (1.1)	4.8 (0.5)	4.0 (2.7)
	Previous Pharmacy Experience	4.3 (1.7)**	3.8 (1.1)	4.0 (1.2)	4.7 (0.5)	4.1 (1.9)
	No Previous Experience	2.9 (1.4)	3.8 (1.1)	4.1 (0.9)	5.0 (0.0)	3.7 (1.3)
Previous Experience (N)		69	84	38	32	223
No Previous Experience (N)		21	26	17	6	70
Total (N)		90	110	55	38	293

^aRating Scale: Six point scale (1="First day student"; 6="Newly qualified professional")

**p*<.05

***p*<.001

P1=First Professional Year, P2=Second Professional Year, P3=Third Professional Year, P4=Fourth Professional Year

or volunteer experiences would provide the incoming student pharmacist with a clearer understanding of the roles and expectations of the profession. Being in a pharmacy environment should help with this development if the student has hands-on experience in the role of the pharmacist and gains an understanding of the skills necessary to be a pharmacist.¹⁵ Development of professional identity may be accomplished through mentoring, orientation sessions, training, and professional practice experiences during the curriculum.¹⁵ However, a proactive student with prior work experience may be able to assimilate and understand the norms and expectations of the profession more easily.

Noble and colleagues examined the influence of the curriculum on the development of professional identity

and observed that the majority of participating students lacked intrinsic motivation to be a pharmacist and approximately 80% of participants entered pharmacy school with unclear ideas and expectations about the role of the pharmacist.¹⁴ One main reason cited by the authors for student difficulty in developing professional identity was that students entering the pharmacy profession had little prior knowledge of the role of the pharmacist. Obtaining pharmacy experience prior to matriculation in a PharmD program may therefore speed development of professional identity.

It was hypothesized in the current study that performance would be significantly higher for students with prior work experience on Top 100 and Top 300

examinations, high stakes examinations that test the basic knowledge of brand and generic nomenclature, dosage forms and strengths, main adverse effects, and counseling points. Though prior work experience allows for repeated visual and tactile exposure to the most commonly dispensed agents in pharmacy, no evidence from this study suggests that this exposure enhanced student performance on these high stakes examinations.

Only two other studies have evaluated the impact of prior pharmacy work experience on academic performance and progression of students through a PharmD curriculum. Mar and colleagues found no significant difference in academic or clinical performance in student pharmacists with prior pharmacy work experience.⁹ In contrast, Valdez and colleagues found that during the second year of pharmacy school, student pharmacists with any pharmacy-related work experience (prior to or during school) had increased knowledge retention of curricular content.¹¹ This difference may have been affected by the fact that while 55% of admitted students in the Valdez study had no prior pharmacy-related work experience, only 17% still had no pharmacy-related experience by the second year of school. The authors anecdotally noted that students without previous pharmacy work experience were identified by the university as those most commonly having academic delays or difficulty.

When considering the practicality of requiring pharmacy experience in applicants, one significant barrier could be availability of sites. Of the 293 respondents in the study, 223 students reported some type of pharmacy-related work experience prior to matriculation and 84% of those reported a duration of experience. Of the 187 students reporting paid work experience, 86% had at least 1 year of experience, ranging up to 11 years. Thus, 76% of the total participating students were able to gain pharmacy experience with 55% having an extended duration of experience (1 year or greater). This suggests that accessibility to pharmacy-related experiences may not be a major barrier.

Another important consideration of requiring pre-pharmacy experience is the potential negative impact on a school's applicant pool. Although the majority of students at Campbell had some pharmacy-related experience prior to matriculation (223), a significant number did not. As a private institution, the financial impact of up to 25% fewer students enrolling due to an added prerequisite would be difficult to manage. Having a requirement for pre-pharmacy experience might not necessarily shrink the size of an incoming class, but it would clearly impact the number of potential applicants who would consider applying.

There are several limitations to this study. Firstly, students from only one pharmacy school self-selected to participate; therefore, it is possible that students with prior work experience or higher confidence levels in their selection of pharmacy as a profession may have participated. Secondly, the balance between respondents throughout the four-year curriculum was uneven, with higher participation by first- and second-year students and the lowest participation among fourth-year students (n=38). Access to fourth-year students in this study was constrained by timing of the study given that these students are geographically dispersed on rotations for much of the year. This cross-sectional snapshot does reveal (as shown in Table 1) that students in the later years of the curriculum have higher perceptions of the elements of professional identity measured by the PSIQ than their classmates in the earlier years of the curriculum. First-year student pharmacists had not yet participated in an Introductory Pharmacy Practice Experience (IPPE) while second-year student pharmacists had only participated in one. Students in the third and fourth year therefore had more pharmacy experience following matriculation. Future studies should consider using a longitudinal design to better understand the temporal development of students' professional identity. Lastly, 84% of fourth-year respondents (n=38) had work experience prior to pharmacy school matriculation, more than the reported work experience of first- through third-year respondents (77%, 76%, and 69%, respectively). This may have affected the increase in self-reported professional identity seen in the fourth-year students compared to students in earlier classes.

CONCLUSION

The pharmacy school curriculum shapes and molds students into the profession of pharmacy through the exposure of didactic learning, faculty role models, and immersion in pharmacy practice experiences. Pre-matriculation pharmacy experience, either voluntary or paid, may increase development of professional identity early in the student experience but may have little impact on academic readiness. Schools and colleges of pharmacy hoping to recruit students with an early sense of professional identity should consider adding such experience to their admissions requirements. However, if pharmacy schools are unable to implement a requirement of work experience in the pharmacy profession due to potential negative impacts on the applicant pool, then they should strongly consider offering IPPE as soon as the first semester of their program.

REFERENCES

1. Accreditation Council for Pharmacy Education. Accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Standards 2016. <https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf>. Accessed October 13, 2015.
2. Medina MS, Plaza CM, Stowe CD, et al. Center for the Advancement of Pharmacy Education (CAPE) Educational Outcomes 2013. *Am J Pharm Ed*. 2013;77(8):Article 162.
3. Accreditation Council for Pharmacy Education. Guidance for the accreditation standards and key elements for the professional program in pharmacy leading to the doctor of pharmacy degree. Guidance for Standards 2016. <https://www.acpe-accredit.org/pdf/GuidanceforStandards2016FINAL.pdf>. Accessed March 3, 2016.
4. Hammer DP. Professional attitudes and behaviors: the “A’s and B’s” of professionalism. *Am J Pharm Educ*. 2000;64(4):455-464.
5. Hammer DP, Berger BA, Beardsley RS, Easton MR. Student professionalism. *Am J Pharm Educ*. 2003;67(3):Article 96.
6. Goldie J. The formation of professional identity in medical students: considerations for educators. *Med Teach*. 2012;34(9):e641-e648.
7. Noble C, Coombes I, Shaw PN, Nissen LM, Clavarino A. Becoming a pharmacist: the role of curriculum in professional identity formation. *Pharm Pract (Granada)*. 2014;12(1):380.
8. Taylor KM, Harding G. The pharmacy degree: the student experience of professional training. *Pharm Ed*. 2007;7.
9. Mar E, Barnett MJ, Tang TT, Sasaki-Hill D, Kuperberg JR, Knapp K. Impact of previous pharmacy work experience on pharmacy school academic performance. *Am J Pharm Educ*. 2010;74(3):Article 42.
10. Tejada FR, Parmar JR, Lang LA, Ghogomu J. A comparison of pharmacy technician experience, degree and major as predictors of academic performance between two racial groups at a historically black university. *Curr Pharm Teach Learn*. 2016;8(1):112-118.
11. Valdez C, Namdar R, Valuck R. Impact of pharmacy experience, GPA, age, education, and therapeutic review on knowledge retention and clinical confidence. *Curr Pharm Teach Learn*. 2013;5(5):358-364.
12. Steinberg M, Morin AK. The impact of prematriculation admission characteristics on graduation rates in an accelerated doctor of pharmacy program. *Am J Pharm Educ*. 2015;79(8):Article 118.
13. Crossley J, Vivekananda-Schmidt P. The development and evaluation of a professional self identity questionnaire to measure evolving professional self-identity in health and social care students. *Med Teach*. 2009;31(12):e603-e607.
14. Noble C, O’Brien M, Coombes I, Shaw PN, Nissen L, Clavarino A. Becoming a pharmacist: students’ perceptions of their curricular experience and professional identity formation. *Curr Pharm Teach Learn*. 2014;6(3):327-339.
15. Smith AE, Hatmaker DM. Knowing, doing, and becoming: professional identity construction among public affairs doctoral students. *J Public Affairs Ed*. 2014;20(4):545-564.