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## Research Note

# Longitudinal evaluation of student professionalism throughout the professional didactic curriculum of a pharmacy program

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## ABSTRACT

**Introduction:** The purpose of this study is to evaluate longitudinal changes in professionalism of pharmacy students across the curriculum using a validated instrument that minimizes ceiling effect.

**Methods:** The Professionalism Assessment Tool (PAT) was administered to first, second, and third year PharmD students twice throughout the first and second professional year (P1 and P2) and three times throughout the third professional year (P3).

**Results:** Longitudinal increases in all five domains of professionalism of the PAT were noted as students progressed through each year of the didactic curriculum. Most demographic categories (sex, age, employment in a pharmacy, and number of other degrees held) of respondents did not affect self-assessment results. Two demographic categories, the number of student organizations and age group, had statistically significant impact on self-reported professionalism.

**Conclusions:** This pilot study showed longitudinal improvement in student self-assessment of professionalism over the course of the didactic curriculum at one school. Self-assessment of pharmacy student professionalism increased over the course of the didactic curriculum and was not affected by most demographics.

## Introduction

Pharmacy students must not only acquire technical and clinical knowledge, but also develop professional attitudes and behaviors while in pharmacy school in order to successfully deliver patient-centered care as a pharmacist.<sup>1,2</sup> Professionalism can influence patient care, health outcomes, therapeutic relationships, and the public's perception and trust of a profession and its members.<sup>1</sup> Student development of professionalism continues beyond the professional pharmacy curriculum through both continuing education and clinical practice.<sup>2,3</sup> Attitudes and behaviors that exemplify professionalism include altruism, honesty and integrity, respect for others, professional presence, professional stewardship, and dedication and commitment to excellence.<sup>2</sup> Students learn these attitudes and behaviors through real and simulated practice, and from practicing pharmacists and academic role models who guide the development of professionalism.<sup>4</sup>

In 2000, the American Pharmacists Association Academy of Students of Pharmacy (APhA-ASP) and the American Association of Colleges of Pharmacy Council of Deans (AACP-COD) published a white paper on student professionalism.<sup>3</sup> This white paper, as well as others published thereafter, outlined the importance of recruiting students committed to professionalism, the development of professionalism while in the pharmacy program, and reinforcing professionalism in practice.<sup>5–7</sup> Additionally, a list of competencies

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needed by future pharmacists published in 2009 also included professionalism as a key skill. The authors called for schools to define professionalism to help guide and promote its development. It also called for the measurement of the development of professionalism in students.<sup>8</sup>

In 2016, the Accreditation Council for Pharmacy Education Standards 2016<sup>9</sup> came into effect. Standard 4 denotes professionalism as essential to the practice of pharmacy and requires outcome data outlining student achievement of professionalism. However, few measures of pharmacy student professionalism exist. Three scales to measure pharmacy student professionalism are present in the literature. A study by Lerkiabundit<sup>10</sup> tested the factor structure of an adapted attitudinal professionalism scale and found the scale could be used for monitoring changes in professionalism of pharmacy students. A second scale, the Behavioral Professionalism Assessment instrument was developed from professional behavior items used on student evaluation forms to measure professionalism.<sup>11</sup> A third scale, the Pharmacy Professionalism Instrument, used the six tenets of professionalism (as defined by the American Board of Internal Medicine) to measure professionalism in pharmacy students and graduates.<sup>12</sup> Lerkiabundit and Chisholm both studied student populations to evaluate changes in student perceptions toward professionalism over time. Chisholm found no differences between incoming and graduate students while Lerkiabundit found differences between student groups based on year.<sup>10,11</sup> The Professionalism Assessment Tool (PAT) used items adapted from the Physicianship Evaluation Form. The Physicianship Evaluation Form aligns with the APhA-ASP/AACP white paper on student professionalism and professionalism variables assessed by Hammer and Chisholm.<sup>11-13</sup> The PAT, developed by Kelley et al.,<sup>14</sup> is a valid and reliable instrument that can be used by students to self-assess behavioral professionalism. The PAT was used at this school to measure changes in professionalism over time because the tool was collectively mapped to the instruments developed by Hammer,<sup>12</sup> Chisholm<sup>11</sup> and the APhA/ASP/AACP white paper on pharmacy student professionalism and due to published validity and reliability results.<sup>14</sup> The results of the multi-institution evaluation of the PAT indicate a moderated ceiling effect, which is essential for measuring professionalism development over time.<sup>14</sup>

Authors of the PAT called for use of the instrument to collect data longitudinally to evaluate professionalism development over time. To date, no further research has been published using the PAT. This pilot study outlines the longitudinal analysis of a cohort's changes in self-assessment of professionalism over the course of three years at one school.

The first objective of this pilot study was to evaluate whether students' self-assessed professionalism increased from P1 to P3 year in a doctor of pharmacy (PharmD) program. Second, we evaluated the influence of certain demographics (sex, age, employment in a pharmacy, other degrees held, student organization membership, and years of undergraduate education) and their impact on longitudinal changes in self-evaluated professionalism scores. Our hypothesis was that self-assessment scores of professionalism would increase from the first semester to the last semester of the didactic portion of the professional program, regardless of demographics.

## Methods

The PAT is a valid instrument used to evaluate the professionalism of pharmacy students. Researchers at seven pharmacy schools developed the tool. Using cross-validation, as well as exploratory and confirmatory factor analysis, they evaluated the relationships between variables, examined internal reliability, and determined if items within each domain were a valid fit.<sup>14</sup> Exploratory factor analysis using data collected from seven institutions demonstrated the items loaded in each domain are a valid fit and are reliable with KR-20 measure of reliability ranging from alpha coefficients of 0.91–0.95.<sup>14</sup>

The PAT is comprised of 33 items within five domains: (1) Reliability and Responsibility, (2) Lifelong Learning and Adaptability, (3) Relationships with Others, (4) Upholding Principles of Integrity and Respect, and (5) Citizenship and Professional Engagement. These domains represent the major tenets of professionalism in pharmacy.<sup>14</sup> Each domain assesses a specific number of related variables using the Miller's Performance Level Label (knows, knows how, shows, shows how, teaches how). This Likert scale was weighted from 1 to 5 (1 = knows, 2 = know how, 3 = shows, 4 = shows how, 5 = teaches how).<sup>15</sup> For example, domain four (upholding principles of integrity and respect) comprises eight items, one of which states "resolving conflicts in a manner that respects the dignity of every person involved" (Appendix 1).<sup>14</sup> As shown in Table 1, each domain had a different potential total score range based on the number of items in each domain. Percentage values for total scores were used to report findings from each domain consistently.

The PharmD program at North Dakota State University includes two years of pre-professional coursework and three years of didactic coursework and one year of advanced pharmacy practice experiences. For this pilot study, the PAT was administered to all professional pharmacy students throughout the didactic curriculum. Survey participation in this study was voluntary and each cohort was emailed the survey with encouragement to participate at the beginning and end of chosen semesters to allow for longitudinal analysis. Participants created a unique four-digit code to allow researchers to match responses over time. North Dakota State University's Institutional Review Board approved this study protocol and procedures.

Demographic data items were added to the PAT and collected from each respondent. Data were collected longitudinally each semester from 2013 to 2016. The independent variable for analysis was year in pharmacy school (professional year 1–3). Age, sex, previous pharmacy work experience, number of other degrees, student organization membership, years of undergraduate education, and time of survey administration were also independent variables. The dependent variables were individual self-evaluated performance domain scores and overall total score.

The overall scores for each domain and total scores for the entire self-assessment were paired for each respondent at four different intervals for the class of 2017 (Table 1 and Table 3). All paired data were compared using an independent samples *t*-test. A Pearson's chi-square test was used to compare the demographic data for paired respondents and all respondents that initially answered the PAT

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