

## RESEARCH ARTICLES

### Assessment of Pharmacy Student Professionalism Across a Curriculum

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**Objectives.** To evaluate changes in professionalism across the curriculum among pharmacy students in different classes.

**Methods.** A professionalism instrument was administered early in the first (P1) year, upon completing the introductory pharmacy practice experiences (IPPE) near the end of the second (P2) year, and upon completing the advanced pharmacy practice experiences (APPE) at the end of the fourth (P4) year.

**Results.** The professionalism scale and its subscales were compared for the 3 time points for the class of 2009. Significant differences were noted in professionalism scores between the P1 and P4 years and for altruism, accountability, and honor/integrity subscale scores for the class of 2009. No significant differences were noted when the scores for 4 P1 classes, and 3 P2 classes were compared.

**Conclusion.** An increase in professionalism scores and altruism, accountability, and honor/integrity scores was demonstrated, providing evidence that the curricular and co-curricular activities in the school of pharmacy helped develop professionalism in the class of 2009 students.

**Keywords:** professionalism, assessment, curriculum

## INTRODUCTION

The American Pharmacists Association Academy of Students of Pharmacy (APhA-ASP) and the American Association of Colleges of Pharmacy Council of Deans (AACP-COD) joint task force on professionalism published a white paper in 2000 to encourage colleges and schools of pharmacy to assess the professionalization process within their curricula.<sup>1</sup> This call to action by the APhA-ASP/AACP-COD spurred several organizations to develop white papers on student professionalism, describing development of the characteristics of a professional among students as a primary goal of colleges and schools of pharmacy.<sup>2-5</sup> Schools and colleges that responded to a survey instrument about efforts to enhance student professionalism reported having professionalization activities such as a white coat ceremony, distribution of the oath of the pharmacist, and participating in professional student organizations.<sup>6</sup> Fewer than half of the responding colleges and schools, however, had required mentoring programs or service-learning activities.

At the Southern Illinois University Edwardsville School of Pharmacy (SIUE-SOP) several professionalization activities are included as both curricular and co-curricular components of the doctor of pharmacy (PharmD) experience. Within the curriculum, students completed a

mandatory 20-contact-hour service-learning experience as part of their first professional (P1) year and were required to complete 1760 contact hours of introductory and advanced pharmacy practice experiences (IPPE and APPE). Students were introduced to the concept of professionalism during the new student orientation and participated in a white coat ceremony during which they recited a pledge of professionalism approved by the APhA-ASP and the AACP-COD.<sup>7</sup> Involvement in professional student organizations and attendance at local, state, and national meetings is encouraged through financial support for travel. The SIUE-SOP also has a structured faculty-student mentoring program. In light of the significant emphasis on student professionalism at the SIUE-SOP, tracking student development in this area is an important assessment goal. The first pharmacy class at SIUE-SOP matriculated during the fall of 2005. As part of the SIUE-SOP master assessment plan, a previously validated professionalism instrument developed by Chisholm was administered during the fall semester of the P1 year and the spring semester of the P2 and P3 years in the PharmD program.<sup>8</sup> The Chisholm questionnaire has been used previously to compare professionalism scores between P1 students and recent PharmD graduates.<sup>8</sup> However, a cohort of students at different points in the curriculum has not been evaluated previously. Thus the purpose of this report was to evaluate changes in professionalism scores across the curriculum and among students in different class cohorts.

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## METHODS

This study was approved by the SIUE Institutional Review Board as an exempt study. The intent was to administer the professionalism instrument at 3 critical points in the PharmD program. The first administration occurred during the fall of the P1 year prior to students entering their first IPPE. The second administration occurred during the spring of the P2 year after students completed their fourth IPPE. The third administration occurred during the P4 year after students had completed all APPEs. The professionalism instrument developed by Chisholm<sup>8</sup> consists of 18 items that are scored on a Likert-type scale with responses ranging from 1 = strongly disagree to 5 = strongly agree. Higher scores indicate a higher level of professionalism. In addition to an overall professionalism score, scores can be obtained for the following subscales: excellence (5 items), respect for others (4 items), altruism (3 items), duty (2 items), accountability (2 items), and honor/integrity (2 items). Scores for overall professionalism and the subscales are calculated by summing the scores for items within the respective scales.

In July 2009, the instrument was administered 3 times for the class of 2009, twice for the classes of 2010 and 2011, and once for the class of 2012. A schematic of the administration schedule for the professionalism instrument with the results of these administrations is shown in Table 1.

The survey instrument was administered online using CourseEval 3.0 (Academic Management Systems, Amherst, NY). To facilitate longitudinal comparisons of the data and to track students throughout the curriculum, students were asked to create a unique 8-digit identifier based on month of birth, date of birth, and the last 4 digits of their social security number. Unfortunately, longitudinal comparison at the individual level could not be performed because unique identifier codes were not reported consistently by the students. Descriptive data were obtained for demographic characteristics of the 4 matriculating classes (2009, 2010, 2011, and 2012). As an estimate of internal consistency, Cronbach's coefficient alpha values were

obtained for the professionalism scale and its subscales during the first administration (P1) for each class cohort. Because individual level data could not be compared, the data were compared at the sample level within and among class cohorts. Therefore, based on the currently available data, scores on the professionalism scale and its subscales were compared within class cohorts for the 3 administrations for the class of 2009 (P1, P2, and P4), and the 2 administrations for the classes of 2010 and 2011 (P1 and P2). Also, as an exploratory exercise, professionalism scale and subscale scores were compared for the 4 administrations during the P1 years (classes of 2009, 2010, 2011 and 2012), and the 3 administrations during the P2 years (classes of 2009, 2010 and 2011). All comparisons were performed using analysis of variance (ANOVA). A significance level of  $p < 0.05$  was used for all analyses. All statistical analyses were performed using the Statistical Package for the Social Sciences software (SPSS, Chicago, IL).

## RESULTS

The demographic characteristics of the matriculating classes of 2009, 2010, 2011, and 2012 are presented in Table 2. No apparent differences in demographic characteristics among the various classes were noted, with the exception of a lower percentage of students with prior degrees in the class of 2011. Internal consistency values for the first administration (P1 year) of the professionalism scale for each class cohort are presented in Table 3. Any subsequent administrations within each class cohort provided similar values. The Chronbach's alpha values for the professionalism scale were all above 0.8, indicating reliability for each class.<sup>9</sup> The Excellence and Respect for Others subscales had acceptable Cronbach's alpha values. However, due to low Cronbach's alpha values ( $< 0.5$ ) for other subscale scores in certain classes, the results should be interpreted with caution.<sup>9</sup>

A comparison of the mean (standard deviation) scores for the professionalism scale and its subscales for the 3 administrations (P1, P2, and P4 years) for the class of 2009 are presented in Table 4. As mentioned earlier,

Table 1. Administration Schedule for Assessing Pharmacy Student Professionalism

	<b>1<sup>st</sup> Administration</b> <b>Semester/Year in Program</b>	<b>2<sup>nd</sup> Administration</b> <b>Semester/Year in Program</b>	<b>3<sup>rd</sup> Administration</b> <b>Semester/Year in Program</b>
Class of 2009	Fall 2006/ P1 year	Spring 2007/ P2 year	Spring 2009/ P4 year
Class of 2010	Fall 2007/ P1 year	Spring 2008/ P2 year	
Class of 2011	Fall 2008/ P1 year	Spring 2009/ P2 year	
Class of 2012	Fall 2009/ P1 year		

Abbreviations: P1 = first-professional year in the PharmD program; P2 = second-professional year in the PharmD program; P4 = fourth-professional year in the PharmD program

Table 2. Demographic Data in Professionalism Study for Matriculating Classes at the SIUE School of Pharmacy

Variable	Class of 2009 (n = 82)	Class of 2010 (n = 80)	Class of 2011 (n = 82)	Class of 2012 (n = 82)
Gender, No. (%)				
Female	43 (52.4)	48 (60.0)	46 (56.1)	48 (58.5)
Male	39 (47.6)	32 (40.0)	36 (43.9)	34 (41.5)
Prior degree (Bachelors or above), No. (%)	30 (36.6)	25 (31.3)	13 (15.9)	20 (24.4)
Race/Ethnicity, <sup>a</sup> No. (%)				
White	68 (82.9)	64 (80.0)	73 (89.0)	70 (85.4)
Black or African American	4 (4.9)	3 (3.8)	2 (2.4)	3 (3.7)
Hispanic or Latino	3 (3.7)	0 (0.0)	0 (0.0)	1 (1.2)
Asian	5 (6.1)	8 (10.0)	3 (3.7)	3 (3.7)
Not Reported	2 (2.4)	5 (6.3)	4 (4.9)	5 (6.1)
Age, Mean (SD)	23.5 (4.9)	22.8 (5.8)	22.4 (4.3)	21.3 (3.5)

<sup>a</sup> Percentages may not add up due to rounding

longitudinal comparisons at the individual level could not be performed because unique identifier codes were not reported consistently by the students. Therefore, comparisons were performed at the sample level. As shown in Table 4 the mean overall professionalism score was significantly higher during the P4 year than the P1 year. Similarly, the mean score on the altruism subscale during the P4 year was significantly higher than the P1 year. For the accountability and the honor/integrity subscales, the mean scores during the P4 year were significantly higher than both the P1 and P2 year scores.

A comparison of the mean (standard deviation) scores for the professionalism scale and its subscales for the P1 and P2 year administrations for the classes of 2010 and 2011 are presented in Table 5. No differences were found in the scores between the P1 and P2 year administrations for these class cohorts. As an exploratory exercise, the professionalism score and subscale scores were compared for all P1 administrations (classes of 2009, 2010, 2011, and 2012) and all P2 administrations (classes of 2009, 2010, and 2011). No significant differences were found for any of these latter comparisons.

## DISCUSSION

In 2001 The American Board of Internal Medicine's (ABIM) Project Professionalism proposed 6 tenets of professionalism: altruism, duty, accountability, honor and integrity, and respect for others.<sup>10</sup> A study conducted by Duke indicated that pharmacy students agreed with these general professionalism tenets.<sup>11</sup> Subsequently, Chisholm developed the instrument that was used in this study that comprised the 6 tenets of professionalism proposed by the ABIM.<sup>8</sup> Chisholm compared P1 pharmacy students with recent graduates and found no differences in professionalism between these 2 cohorts.<sup>7</sup> In contrast, a significant increase in the overall professionalism score was demonstrated after the class of 2009 students had completed the entire PharmD curriculum (end of P4 year), in comparison to the P1 year prior to their first IPPE. A probable explanation is that the students had developed attributes of professionalism during their PharmD education.

We also found a significant increase in the altruism, accountability, and honor/integrity subscale scores from the P1 year to the end of the P4 year. This maturation could be linked to the APPE. During APPEs, students

Table 3. Cronbach's Alpha Values for Professionalism Scale and Subscales for the First Administration of Each Class Cohort

Scale/Subscale (No. of Items)	Cronbach's Alpha			
	Class of 2009	Class of 2010	Class of 2011	Class of 2012
Professionalism (18)	0.90	0.82	0.87	0.86
Excellence (5)	0.77	0.66	0.72	0.71
Respect for Others (4)	0.75	0.63	0.71	0.73
Altruism (3)	0.52	0.15	0.54	0.57
Duty (2)	0.45	0.32	0.35	0.18
Accountability (2)	0.49	0.65	0.46	0.48
Honor/Integrity (2)	0.63	0.30	0.37	0.23

Table 4. Comparison of Professionalism Scale and Subscale Scores Across the Curriculum for the Class of 2009

Scale/Subscale	P1, Mean (SD)	P2, Mean (SD)	P4, Mean (SD)
	n = 79	n = 61	n = 80
Professionalism	78.5 (7.9) <sup>a</sup>	78.9 (6.8)	81.5 (8.0) <sup>a</sup>
Excellence	22.3 (2.2)	22.6 (2.2)	22.9 (2.3)
Respect for Others	17.3 (2.1)	17.3 (1.8)	17.9 (2.3)
Altruism	12.9 (1.6) <sup>b</sup>	13.0 (1.5)	13.5 (1.7) <sup>b</sup>
Duty	9.2 (1.1)	9.1 (1.1)	9.0 (1.2)
Accountability	8.3 (1.4) <sup>c</sup>	8.4 (1.1) <sup>d</sup>	8.9 (1.2) <sup>c,d</sup>
Honor/Integrity	8.4 (1.4) <sup>c</sup>	8.6 (1.3) <sup>f</sup>	9.2 (1.1) <sup>e,f</sup>

<sup>a-f</sup> Scores with the same superscript are significantly different using the Scheffe post hoc test ( $p < 0.05$ )

ANOVA results: Professionalism,  $p = 0.03$ ; Altruism,  $p = 0.021$ ; Accountability,  $p < 0.01$ ; Honor/Integrity,  $p < 0.001$

are provided routinely with frequent individual feedback, which helps develop their ability to accept constructive criticism, and the willingness to accept the consequences for failure to follow through with responsibilities. Additionally, these changes could be attributed in part to the several professionalization activities included in our PharmD curriculum. Even though no changes were reported between the P1 year and upon completion of the IPPEs in the P2 year, we believe the numerous professional activities during this period laid the foundations for further development. For example, during the P1 year, students participated in a mandatory service-learning project, such as counseling on Medicare Part D, File of Life, and poison prevention education for elementary students. Students at SIUE were also involved with various student organizations where professional service contributions were made; during the 2008-2009 academic term, the student chapter of the Academy of Student Pharmacists participated in 15 professional service events. The maturation of the development of a successful learning community may also have contributed to the change.<sup>12</sup> All these experiences are linked to the development of professionalism attributes and are consistent with the SIUE values of citizenship, excellence, integrity, openness, and wisdom.

The P3 year also included curricular components that may have been responsible for the professionalism score changes noted. An emphasis on development of cultural competency, and a servant attitude also may have contributed to the changes noted with the class of 2009.<sup>13</sup> Additionally, SIUE has offered 2 required pharmacy rounds courses in the P3 year, the major purpose of which has been to develop life-long learning skills, community engagement, and professional development, accomplished by students participating in various learning activities. These activities have included attendance or completion of 1 continuing professional education program; participation at journal club presentation or faculty development/research seminars; 1 educational presentation to a lay audience; and participation in selected public advocacy activities such as legislative day, health care screenings, or other community services. Readministering the professionalism scale after the P3 year may have indicated more fully the curricular impact of the P3 year on professionalism scores.

No significant differences were reported in the tenets of excellence, respect for others, and duty. The selection process for enrollment in pharmacy school may already include a high level of these attributes. For example,

Table 5. Comparison of Professionalism Scale and Subscale Scores Across the Curriculum for the Class of 2010 and 2011

Scale	Class of 2010, Mean (SD)		Class of 2011, Mean (SD)	
	P1 Students (n = 70)	P2 Students (n = 48)	P1 Students (n = 74)	P2 Students (n = 42)
Professionalism	80.5 (5.6)	80.5 (5.3)	79.9 (6.5)	79.6 (13.8)
Excellence	22.8 (1.9)	23.0 (1.7)	22.5 (2.1)	22.6 (4.0)
Respect for Others	17.5 (1.9)	17.3 (1.7)	17.4 (1.8)	17.4 (3.3)
Altruism	13.2 (1.3)	13.3 (1.4)	13.2 (1.6)	13.4 (2.4)
Duty	9.2 (0.9)	9.2 (1.1)	9.3 (0.8)	9.1 (1.7)
Accountability	8.7 (1.1)	8.8 (1.1)	8.7 (1.1)	8.6 (1.7)
Honor/Integrity	9.0 (0.8)	9.0 (1.0)	8.7 (1.1)	8.6 (2.0)

during the admissions process, students with community or volunteer service and those who have been involved in student organizations may be given a preference for enrollment. Also, during the interview process the admissions committee has preferred students with empathy and those who can work well in a team. As no apparent differences in demographic characteristics among the various classes was noted, subsequent analysis of the other class cohorts would likely reveal results similar to the class of 2009.

This study has some limitations that need to be addressed in future investigations of professionalism across the PharmD curriculum. As mentioned previously, a unique 8-digit identifier based on the student's month of birth, date of birth, and the last 4 digits of their social security number were created to facilitate longitudinal comparisons. Unfortunately, longitudinal comparison at the individual level could not be performed because unique identifier codes were not reported consistently by the students. As a result, comparisons had to be performed at the sample level within each class cohort even though the data are dependent in nature. Therefore, the significant differences obtained in this study should be interpreted with caution. Nonetheless, this was the first study to compare professionalism scores for pharmacy students across the curriculum. Future studies should strive to capture unique identifiers consistently so that a true longitudinal comparison can be performed.

Another limitation is that some of the subscales in the professionalism instrument had low reliability coefficients (Cronbach's alpha < 0.50). The instrument was developed by Chisholm using established psychometric techniques, and was the only instrument developed when this study commenced that could be used as a self-report professionalism measure among pharmacy students.<sup>7</sup> Moreover, Chisholm has suggested that the instrument should be tested in other pharmacy student samples.<sup>8</sup> Future studies should consider refinements to the instrument so that better reliability coefficients can be obtained.

Though we have suggested several possible explanations for the results in this study, it would be beneficial in the future to compare whether professionalism data vary by demographic data such as age, gender, race/ethnicity, or having a previous degree. These comparisons were not possible in this study because these demographic data were not collected as part of the study questionnaire. Also, in future studies, controlling for the effect of demographic characteristics on changes in professionalism scores might allow the attribution of these changes more specifically to components of a curriculum. Additionally, including

colleges and schools requiring students to maintain a portfolio to identify experiences impacting the development of professional behaviors would be worthwhile.

## CONCLUSION

A significant increase in professionalism scores and also in altruism, accountability, and honor/integrity subscale scores were demonstrated among a cohort of students early in the first year of the pharmacy curriculum and upon completion of the program at a new school of pharmacy. The Chisholm professionalism scale demonstrated internal consistency for the overall professionalism score, verifying the scale provided evidence that the curricular and co-curricular activities in the SIUE School of Pharmacy fostered professionalism in the students.

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