RESEARCH ARTICLES

Variables Impacting an Academic Pharmacy Career Choice

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Objectives. To identify the variables associated with an academic pharmacy career choice among the following groups: final professional-year doctor of pharmacy (PharmD) students, pharmacy residents, pharmacy faculty members within the first 5 years of academic employment, and clinical pharmacy practitioners.

Methods. A cross-sectional design Web-based survey instrument was developed using the online tool *SurveyMonkey*. The survey link was distributed via e-mail and postcards, and data were collected anonymously. Quantitative analyses were used to describe the 2,494 survey respondents and compare their responses to 25 variables associated with an academic pharmacy career choice. Logistic regression models were used to predict the motivators/deterrents associated with an academic pharmacy career choice for each participant group.

Results. Across all participant groups, the potential need to generate one's salary was the primary deterrent and autonomy, flexibility, and the ability to shape the future of the profession were the primary motivators. Final-year pharmacy students who considered a career in academic pharmacy were significantly deterred by grant writing. The overall sample of participants who considered an academic pharmacy career was more likely to be motivated by the academic environment and opportunities to teach, conduct professional writing and reviews, and participate in course design and/or assessment.

Conclusions. This study demonstrates specific areas to consider for improved recruitment and retention of pharmacy faculty. For example, providing experiences related to pharmacy academia, such as allowing student participation in teaching and research, may stimulate those individuals' interest in pursuing an academic pharmacy career.

Keywords: academia, faculty, career, motivating factors

INTRODUCTION

Workforce studies conducted since 2000 have consistently indicated a shortage in the number of licensed pharmacists in the United States.[1-2] As of 2007, in response to this shortage, the number of colleges and schools of pharmacy recognized with some level of accreditation status has increased to 103.[3] Even though there has been a 13% increase in the number of PharmD graduates over the last 10 years, this falls far short of current and projected needs. The pharmacist shortage also has resulted in greater competition for existing pharmacists to enter or remain in academic pharmacy careers, resulting in a simultaneous faculty shortage. The pharmacy faculty population has increased only 23%, while student enrollment has increased 40%.[4-6] A compounding issue of the faculty shortage is the retirement of current faculty members. The estimated percentage of faculty members within 10 years of retirement has grown from 35% to 42% since 1997.[5]

A Health Resources and Services Administration (HRSA) workforce report noted that the "recruitment of

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pharmacy practice faculty away from schools and colleges of pharmacy [is] hampering schools' ability to increase class size."[1] Because of employment competition from non-academic pharmacy practice, schools and colleges must work to understand what variables would entice clinical practitioners and new pharmacy graduates to academia versus industry. By knowing these variables, academic leaders will be better equipped to effectively staff their programs, and in turn, matriculate the volume of graduates needed.

While numerous studies have been conducted on pharmacy career paths, faculty morale, and general pharmacy student career stastitics,[1-14] a review of the literature indicated that a large-scale research study of the motivations and deterrrants of an academic pharmacy career had not been conducted. Therefore, the primary objective of this study was to identify the motivating or deterring variables associated with considering a career in academic pharmacy among final-year pharmacy students, residents, and clinical practitioners; these variables also were examined among pharmacy faculty members.

METHODS

The study population included all final-year PharmD students in the United States, pharmacy residents in programs accredited by the American Society of Health System Pharmacists (ASHP), all clinical pharmacy practitioners certified by the Board of Pharmaceutical Specialties (BPS), and pharmacy faculty members within their first 5 years of appointment at schools and colleges of pharmacy. At the time of this study's inception, there were approximately 10,000 final year PharmD students, 1,800 pharmacy residents, 5,000 certified clinical practitioners, and 1,100 new pharmacy faculty in the United States. Therefore, the potential total study population was near 18,000.

To develop the questionnaire for this study, a literature review was conducted to identify any variables that previously had been examined in relation to pharmacy academic career choice.[6-16] The review focused on pharmacy student and pharmacist career aspirations, student academic rotations, student mentoring, academic pharmacy career pathways and opportunities, pharmacy residency teaching certificate programs, academic pharmacy employment requirements, faculty development programs, and other related pharmacy faculty workforce issues. Two databases were searched encompassing 36 years (OVID: 1970-July 2006; ERIC: 1986-September 2006). Fourteen key MESH terms were utilized in the search (careers, curriculum, data collection, degrees, education, educators, faculty, pharmaceutical education, pharmacists, pharmacy, recruitment, residency, schools, and students). The variables identified from this search served as the characteristic items included in the survey instrument. Sample findings from the literature review included career counseling, mentors, salary, job security, position autonomy, and prior participation in teaching certificate programs.[6-16] A complete listing of the factors identified through the literature search are presented in Table 1. Using this information as a starting point, an online survey instrument was created in *SurveyMonkey* to distinguish recruiting groups and ascertain their key deterrents or motivators in choosing or considering an academic pharmacy career.

The survey instrument was divided into 2 primary sections: demographics and motivators/deterrents. The demographic questions included "current position or employment classification" to distinguish the participant groups: final-year PharmD student, first-year resident (PGY1), second-year resident (PGY2), fellow, faculty member, clinical practitioner, and other. The motivator/deterrent section was subdivided into 4 groups of items to be answered on a 5-point scale ranging from "strong motivator" to "strong deterrent," plus "N/A" (not applicable). The first group consisted of items related to financial considerations. The second and third groups consisted of items related to prior exposure to academia and possible opportunities or challenges associated with an academic pharmacy career. The fourth group of questions asked participants to rate the degree to which categories of individuals, such as a dean, preceptor, professor, or community pharmacist, served as either a motivator or deterrent in the participant's decision to pursue a career as a faculty member. A final group of questions allowed open-ended answers to general questions about motivating and deterring factors. (A copy of the survey instrument is available from the corresponding author.)

The study questionnaire was reviewed by a psychometrician and pilot tested for face validity on 20 pharmacy students, 8 pharmacy residents, and 7 new pharmacy faculty members at the University of Tennessee College of Pharmacy. The primary outcome of the review and pilot test was the addition of a "neither motivator nor deterrent" choice for the motivator/deterrent questions. The research study was approved by the Institutional Review Board (IRB) of each author's institution prior to beginning the pilot study.

E-mails or postcards containing the web address to the online survey instrument were disseminated to each target group and a 3-week window was given for survey completion. Directors of experiential learning at each US school and college of pharmacy were asked to forward the e-mail to their final-year PharmD students. The experiential directors' contact information was provided by the

Table 1. Literature Search Findings on Factors Influencing Academic Career Choice as of September 1, 2006

Focus Area and Issue	Student	Resident/Fellow	Pharmacist (0-5 yr)
Exposure/Skill Enhancement			
Elective courses (P-1 through P-3 equiv) (eg, teaching & learning methodology; educational theory and practice)	✓	✓	✓
APPE elective rotation (eg, academic/admin; academic)	✓	✓	✓
Career pathway counseling	✓	✓	✓
Small group, didactic and clinical teaching experience	✓	✓	✓
Teaching seminars/workshops (eg, adult learning, pedagogical training, curriculum design)	✓	✓	✓
Scholarly activity seminars/workshops (eg, grant writing, clinical trial design, publishing)		✓	✓
Formalized residency teaching certificate program		✓	✓
Formalized post-graduate teaching certificate program (university-based curriculum)		✓	✓
Formalized leadership development program	✓	✓	✓
Teaching portfolio	✓	✓	✓
Mentorship, administrative, clinical teaching, professional, leadership development	✓	✓	✓
New faculty orientation program			✓
Innovative application of scientific/medical knowledge		✓	✓
Professional mtg. attendance (eg, AACP, ACCP, ASHP, APhA)	✓	✓	✓
Inadequate preparation for academic pharmacy career	✓	✓	✓
Financial			
Salary gradient	✓	✓	✓
Loan repayment (with or w/o min. service requirement)	✓	✓	✓
Loan cancellation (partial)	✓	✓	✓
BPS certification fee paid		✓	✓
Scholarships for academic career track	✓		
Fellowships for academic career track	✓		
Job security		✓	✓
Opportunities for advancement		✓	✓
Job fringe benefits	✓	✓	✓
Academic work study or related (eg, TA) position	✓	✓	✓
Start-up package		✓	✓
Geographic location of positions		✓	✓
Other			
Age	✓	✓	✓
Gender	✓	✓	✓
Position flexibility/autonomy		✓	✓
Prestige (professional; community)	✓	✓	✓
Uniqueness of practice environment	✓	✓	✓
Ability to focus on the future of pharmacy	✓	✓	✓
Years in school prior to obtaining 1st pharmacy degree	✓		
Previous degrees prior to pharmacy degree	✓		

American Association of Colleges of Pharmacy (AACP) Professional Education Program Special Interest Group (PEPSIG). Directors of ASHP-accredited residency programs were asked to forward the e-mail to their pharmacy residents. The residency directors' contact information was also provided by ASHP. Pharmacy faculty members within their first 5 years of appointment in an academic pharmacy position were contacted via e-mail using faculty contact information provided by AACP. Board Certified Pharmaceutical Specialist (BCPS) practitioners were contacted directly by postcard using mailing addresses provided by BPS. In an effort to improve the survey response rate, a reminder e-mail or postcard was sent to each group 2-weeks after the initial mailing.[17]

Individual participants' survey responses remained anonymous throughout the study: data were downloaded in aggregate from *SurveyMonkey*. Data were imported into the Statistical Package for Social Sciences, version 15 (SPSS, Inc, Chicago, IL) for quantitative analyses.

Descriptive statistics were obtained for demographic variables to describe the sample. The motivator/deterrent variable responses were recoded so that higher scores indicated stronger motivation. Mean and standard deviation values were calculated for each of the motivator/deterrent variables. Although a wide variety of data were collected via the survey, the authors chose to focus on the objectives of the current paper, namely, the primary motivators and deterrents to a career in pharmacy academia.

To identify the predictors of whether the respondents had "considered a career in academic pharmacy (pharmacy faculty position)," this dichotomous variable was regressed on the motivator/deterrent variables using a stepwise forward conditional binary logistic regression (backward stepwise logistic regression provided us with essentially the same results). Regression models were obtained for each participant group (final-year PharmD student, first-year resident (PGY1), second-year resident (PGY2), faculty member, clinical practitioner, and other). The condition or significance level used for inclusion of the variable in the forward stepwise model was $p < 0.05$. This regression technique was used since we did not have a priori hypotheses for a set of predictor variables for each participant group. Rather, these were exploratory logistic regression models. The chi-square goodness-of-fit test also was obtained for each model.

Only respondents with data available for all predictor variables are included in the regression procedure: logistic regression examines cases listwise, which eliminates cases that include "N/A" responses or have missing data. If all original variables had been used, it would have resulted in very small sample sizes and very large odds ratio and standard error estimates. Therefore, as suggested by Tabachnik and Fidell, variables that had the highest number of excluded data (those which most likely did not apply to all participant groups) were removed from the current analyses.[18] Additionally, since only 6 responses were received from fellows and some responses were incomplete, fellows' data were not included in the data analyses. After deletion of the 12 variables that may have caused problems with the logistic regression, the following 25 independent variables were used for the logistic regressions: faculty salary, job security, potential need to generate part of salary through research or clinical practice, faculty position fringe benefits, faculty "start-up" package, flexibility for expanded professional income-generating activities (eg, consulting, practice plans), financial support for professional meeting attendance, financial support for professional organization leadership (eg, elected official, board of directors) completing an academic elective rotation, opportunities to engage in small group teaching activities, opportunities to engage in classroom teaching activities, exposure to teaching seminars/workshops (eg, adult learning, pedagogical training, curriculum design), participation in grant proposal writing, participation in research, participation in professional writing, publication, and manuscript review activities, participation in academic course design and/or assessment, opportunities to attend professional meetings, geographic location of available faculty positions, opportunities for professional advancement, the personal flexibility of faculty positions (eg, address family needs, ability to pursue outside interests), autonomy of faculty positions (eg, academic freedom, no time clocks), professional prestige associated with faculty positions, uniqueness of the academic environment, ability of pharmacy faculty to shape the future of pharmacy, encouragement from a mentor.

All faculty were excluded from the logistic regression procedure because they should have answered "yes" to the dichotomous question "considered a career in academic pharmacy (pharmacy faculty position)," thereby impeding the ability to perform analyses based on 2 opposing answers. Therefore, additional analyses were performed to include faculty data: means and standard deviations for each of the above 25 independent variables were collected for faculty members, as well as for each of the other participant categories. The means and standard deviations for the strongest motivators and deterrents for each participant category were analyzed.

RESULTS

Responses were obtained from 2,494 individuals. The mean age of the respondents was 30.7 years ± 8.2 years, ranging from 20 to 70 years of age. Approximately 78.6% of the participants answered all of the educational status questions. Of those, the degrees held included the following: non-pharmacy bachelor's degree (n = 816; 41.6%), bachelor of science in pharmacy degree (n = 560; 28.5%), master's degree (n = 212; 10.8%), PharmD (n = 1,377; 70.4%), and non-PharmD doctorate degree (n = 131; 6.7%). The self-assigned participant groups were: 925 final year PharmD students (37%), 461 first-year pharmacy residents (18.5%), 106 second-year pharmacy residents (4.3%), 532 faculty (21.3%), 351 clinical practitioners (14.1%), and 119 other (4.8%). Additional demographic data are presented in Table 2.

In neither the overall sample nor the individual participant groups did any of the 25 independent variables have a mean score that indicated the factor was a strong

Table 2. Demographics of Respondents to a Survey to Determine Factors Influencing an Academic Pharmacy Career Choice (N = 2494)

Variable	No. (Valid %)
Gender	
Male	793 (32.2)
Female	1673 (67.8)
Race	
American Indian or Alaska Native	9 (0.4)
Asian	290 (11.8)
Black or African-American	87 (3.5)
Native Hawaiian or Pacific Islander	5 (0.2)
White or Caucasian	1982 (80.8)
Other	80 (3.3)
Ethnicity	
Hispanic or Latino	64 (3.0)
Not Hispanic or Latino	2092 (97.0)
Marital Status	
Married living together	1133 (46.0)
Married separated	20 (0.8)
Divorced	58 (2.4)
Widowed	2 (0.1)
Single	1027 (41.7)
Living with partner or significant other	223 (9.1)

deterrent. A weak deterrent for the overall sample was the potential need to generate part of salary through research or clinical practice (2.5 ± 1.2). Motivators with a mean greater than 4.3 were the ability to shape the future of pharmacy (4.3 ± 0.8), personal flexibility of faculty positions (4.4 ± 0.9), and autonomy of faculty position (4.4 ± 0.8).

A weak deterrent for new faculty members was the potential need to generate part of salary through research or clinical practice (2.7 ± 1.1). Strong motivators were as follows: ability to shape the future of pharmacy (4.5 ± 0.7), uniqueness of academic environment (4.5 ± 0.7), personal flexibility of faculty positions (4.6 ± 0.7), and autonomy of faculty position (4.8 ± 0.6). Low and high mean data for each of the 6 groups is presented in Table 3.

The logistic regression result for all participant groups is presented in Table 4. The overall model with 6 predictors was significant ($p < 0.001$), indicating that these predictors reliably distinguished between participants who had considered a career in academic pharmacy and those who had not. The odds ratios (95% CI) for the individual predictors indicated, that compared with those participants who had not considered a career in academic pharmacy, those who considered a career in academic pharmacy were more likely to perceive the following as motivators: financial support for professional meeting attendance (OR = 1.32; 95% CI = 1.04-1.67), opportunities to engage in small group teaching activities (OR = 1.55; 95% CI = 1.18-2.05), opportunities to engage in classroom teaching activities (OR = 1.72; 95% CI = 1.35-2.19), participation in professional writing, publication, and manuscript review activities (OR = 1.28; 95% CI = 1.10-1.49), participation in course design and/or assessment (OR = 1.48; 95% CI = 1.17-1.87), and uniqueness of the academic environment (OR = 1.45; 95% CI = 1.13-1.85).

The logistic regression result for final-year PharmD students is presented in Table 4. The overall model with 6 predictors was significant ($p < 0.001$). The odds ratios (95% CI) for the individual predictors indicated that participants who considered a career in academic pharmacy were significantly deterred by grant writing (OR = 0.57; 95% CI = 0.36-0.90). They were more likely to perceive opportunities to engage in classroom teaching activities (OR = 4.46; 95% CI = 2.73-7.31), participation in research (OR = 1.49; 95% CI = 1.01-2.19), participation in professional writing, publication, and manuscript review activities (OR = 1.62; 95% CI = 1.05-2.51), participation in course design and/or assessment (OR = 1.71; 95% CI = 1.04-2.81), and the ability of pharmacy faculty members to shape the future of pharmacy (OR = 1.89; 95% CI = 1.11-3.23) as motivators.

The logistic regression result for first- and second-year pharmacy residents is presented in Table 4. For first-year residents, the overall model with 3 predictors was significant ($p < 0.001$). The odds ratios (95% CI) for the individual predictors indicated that participants who considered a career in academic pharmacy were more likely to perceive opportunities to engage in small group teaching (OR = 2.22; 95% CI = 1.34-3.66), exposure to teaching seminars/workshops (OR = 1.88; 95% CI = 1.08-3.26), and participation in course design and/or assessment (OR = 2.42; 95% CI = 1.46-3.99) as motivators.

For second-year residents, the overall model with 2 predictors was significant ($p < 0.001$). The odds ratios (95% CI) for the individual predictors indicated that participants who considered a career in academic pharmacy were more likely to perceive job security (OR = 2.42; 95% CI = 1.08-5.45) and uniqueness of the academic environment (OR = 6.74; 95% CI = 2.11-21.55) as motivators.

The logistic regression result for clinical practitioners also is presented in Table 4. The overall model with 2 predictors was significant ($p < 0.001$). The odds ratios (95% CI) for the individual predictors indicated that participants who considered a career in academic pharmacy were more likely to perceive opportunities to engage in

Table 3. Weak Deterrents and Weak-Strong Motivators Indicated by Participants in a Survey Regarding Academic Pharmacy Career Choice

	Response, Mean Rating (SD)[a]				
Variable	**Final-Year PharmD Student**	**PGY1**	**PGY2**	**Faculty**	**Clinical Practitioner**
Potential need to generate part of your salary...	2.4 (1.2)	2.5 (1.2)	2.4 (1.2)	2.7 (1.1)	2.3 (1.1)
Participation in grant writing	2.5 (1.1)				
Faculty salary		2.7 (1.1)			2.7 (1.3)
Opportunities to engage in classroom teaching			4.3 (0.9)	4.3 (0.8)	
Opportunities for professional advancement			4.3 (0.9)	4.4 (0.7)	
Opportunities to engage in small group teaching			4.3 (0.8)	4.3 (0.8)	
Ability to shape future of pharmacy		4.4 (0.7)	4.4 (0.8)	4.5 (0.7)	4.3 (0.8)
Personal flexibility of faculty positions		4.3 (0.9)	4.4 (0.8)	4.6 (0.7)	4.3 (0.8)
Autonomy of faculty positions	4.3 (0.9)	4.4 (0.8)	4.5 (0.7)	4.8 (0.6)	4.3 (0.8)
Uniqueness of academic environment				4.5 (0.7)	

[a] 1 = strong deterrent, 2 = weak deterrent, 3 = neither deterrent nor motivator, 4 = weak motivator, 5 = strong motivator; included results ≤ 2.7 and ≥ 4.3

classroom teaching activities (OR = 2.00; 95% CI = 1.36-2.93) and uniqueness of the academic environment (OR = 2.03; 95% CI = 1.31-3.15) as motivators.

DISCUSSION

The potential deterrent of academic pharmacy salaries in contrast to nonacademic pharmacy salaries[6] was examined, yet the faculty salary was revealed only to be a weak deterrent in the PGY1 and clinical practitioner participants. However, a consistent finding was the negative relationship associated with the potential need to generate a portion of one's salary through research or clinical practice. The impact of this should be considered when engaging in new faculty position negotiations, as it may not be a well-embraced concept.

Opportunities to engage in teaching, opportunities for professional advancement, the ability to shape the future of pharmacy, personal flexibility and autonomy of faculty positions, and the uniqueness of the academic environment were motivators of various participant groups. Grant writing was a slight deterrent for pharmacy students interested in a career in pharmacy academia, yet it was not a deterrent for residents or clinicians. This suggests the positive impact of gaining additional experience in this area.

The importance of focused exposure to didactic-related activities can be implied from the logistic regression results; these curriculum and instruction-related factors were significant in the groups' consideration of pursuing a career in academic pharmacy: opportunities to participate in classroom teaching (P4 and clinical practitioners), small group teaching (PGY1), course design and/or assessment (P4), and teaching seminars/workshops (PGY1). This finding supports previously published observations.[8,12,13] As pharmacy students and young professionals may be influenced significantly by their educational experiences and environments, efforts to further reinforce these concepts by well-designed exposure opportunities for students and residents may be critical to shaping their career selections.

As is evident from the above information, a primary benefit of this study is the identification of the motivators and deterrents of an academic pharmacy career for the participant groups (final-year pharmacy students, first-year pharmacy residents, second-year pharmacy residents, and clinical pharmacy practitioners). By looking at what these groups view as positives and negatives, pharmacy administrators, faculty members, and/or marketing personnel can specifically target and reinforce that group's perceived "benefits" during the academic program (for students and residents) and in the job announcements themselves. Highlighting and internally promoting these motivators may attract those who are undecided about their pharmacy career path.

Information from recently hired pharmacy faculty members (Table 3) may assist in improving faculty morale and retention. For example, since personal flexibility is seen as a strong motivator (mean = 4.6), it may not be wise to enact changes that would severely minimize the benefit of flexible work hours. If there are notable differences between how a pharmacy school operates and the identified motivators and deterrents for any of the target groups, a school may want to examine whether these differences may be hampering their recruitment and retention efforts.

Table 4. Stepwise Logistic Regression Models for Variables Associated with Considering an Academic Pharmacy Career

Model and Variable	Odds Ratio (95% CI)	*p*
Model for All Groups[a]: χ^2 (6, N = 851) = 285.52, $p < .001$		
Financial support for professional meeting attendance	1.32 (1.04, 1.67)	<0.05
Opportunities to engage in small group teaching activities	1.55 (1.18, 2.05)	<0.001
Opportunities to engage in classroom teaching activities	1.72 (1.35, 2.19)	<0.001
Participation in professional writing, publication, and manuscript review activities	1.28 (1.10, 1.49)	<0.001
Participation in academic course design and/or assessment	1.48 (1.17, 1.87)	<0.001
Uniqueness of the academic environment	1.45 (1.13, 1.85)	<0.001
Model for P4 Students: χ^2 (6, N = 244) = 150.08, $p < .001$		
Opportunities to engage in classroom teaching activities	4.46 (2.73, 7.31)	<0.001
Participation in grant proposal writing	0.57 (0.36, 0.90)	<0.05
Participation in research	1.49 (1.01, 2.19)	<0.05
Participation in professional writing, publication, and manuscript review activities	1.62 (1.05, 2.51)	<0.05
Participation in academic course design and/or assessment	1.71 (1.04, 2.81)	<0.05
Ability of pharmacy faculty to shape the future of pharmacy	1.89 (1.11, 3.23)	<0.05
Model for PGY1: χ^2 (3, N = 264) = 82.20, $p < .001$		
Opportunities to engage in small group teaching activities	2.22 (1.34, 3.66)	<0.001
Exposure to teaching seminars/workshops (eg, adult learning, pedagogical training, curriculum design)	1.88 (1.08, 3.26)	<0.05
Participation in academic course design and/or assessment	2.42 (1.46, 3.99)	<0.001
Model for PGY2: χ^2 (2, N = 63) = 22.87, $p < .001$		
Job security	2.42 (1.08, 5.45)	<0.05
Uniqueness of the academic environment	6.74 (2.11, 21.55)	<0.001
Model for Clinical Practitioners: χ^2 (2, N = 215) = 42.39, $p < .001$		
Opportunities to engage in classroom teaching activities	2.00 (1.36, 2.93)	<0.001
Uniqueness of the academic environment	2.03 (1.31, 3.15)	<0.001

Abbreviations: P4 = fourth or final professional year in a doctor of pharmacy (PharmD) program; PGY1 = first-year pharmacy residents; PGY2 = second-year pharmacy residents

[a]This analysis does not include current faculty members. See Methods section of text

This study's findings were similar to findings of related research focused on identifying factors effective in educating and motivating pharmacy professionals on the value of an academic pharmacy career. However, 4 potential errors of mail and Internet survey research—coverage, sampling, measurement, and non-response errors—may have occurred in this study.[17] The authors attempted to obtain the best possible mailing and e-mail lists to contact potential respondents in our participant groups. Yet coverage error, or the extent to which the lists did not include all potential respondents in the populations for each of the participant categories, still may have occurred. In addition, we have no means of confirming that our e-mails were forwarded to all potential respondents. It also is difficult to judge the accuracy of the contact lists. For example, the study was intended only for US respondents, but the BPS distribution list also included approximately 175 international practitioners. It was not possible to determine how many international practitioners completed the survey. Additionally, during the survey administration period, it was discovered that the AACP faculty distribution list not only included new faculty members, but existing/veteran faculty members in new positions. Some of these faculty members self-selected out of the survey after reading the description or contacting one of the authors, but it is possible that others may have completed the survey instrument. The difference in motivating factors between new and veteran faculty members is unknown to the authors at this time.

Another potential source of error that generally occurs in survey research is sampling error. Since all individuals belonging to the participant groups were not surveyed, sampling error occurred in our study. However, the authors did attempt to contact every individual on the obtained contact lists. Additionally, since all potential respondents did not answer the survey, as is evidenced by the small sample of respondents relative to the large number of contacts that were attempted with potential

respondents, nonresponse error also occurred. The authors do not have data on the nonrespondents and therefore it is not possible to predict whether the nonrespondents resemble the respondents. However, a follow-up mailing was sent to all potential respondents to attempt to increase the response rate.

One of the aims of the pilot study was to increase the clarity of the questionnaire items and thereby reduce measurement error. Nevertheless, it is possible that there may have been some level of measurement error as a result of participants' misinterpretation of questionnaire items. Finally, although fellows were included on the survey as a participant category, they were not targeted by mail. Therefore, only 6 fellows responded to the survey and their data had to be excluded for statistical purposes. Results of the survey cannot therefore be generalized to the pharmacy fellow population. As many pharmacy practice faculty members possess fellowship training, it is important to conduct further research within this population.

A primary focus of most previously published pharmacy practice residency teaching program evaluation studies has been to examine program satisfaction and perceived benefit of the knowledge and skills gained. What has been missing, however, is a more targeted examination of the direct relationship between a resident's participation in and/or completion of this type of program and choosing a career in academic pharmacy. Further research evaluating the influence of this relationship is warranted. This would assist the academy in determining whether a goal of better preparing pharmacists for future roles as academicians has been realized.

All additional variables and data collected, such as prior participation in teaching certificate programs, completion of an academic elective rotation, and influence of position-specific mentors, will be analyzed by the authors for subsequent research studies. While variables such as these were noted as important factors in the literature, they were not prevalent enough in the sample to analyze for the purposes of this study.

CONCLUSION

Challenges to attracting pharmacists to academic pharmacy careers make it imperative to study the associated variables. Analyses of the various participant groups showed that teaching, professional advancement opportunities, ability to shape the profession's future, personal flexibility, autonomy, and the academic environment were/would be motivators of an academic pharmacy career. Faculty salary was a weak deterrent to first-year residents and clinical practitioners, while the potential need to generate a portion of the salary through research or clinical practice was a deterrent to every group. The information presented in this study can be used to assist in the planning and development of new colleges and schools, enhance faculty recruitment and retention strategies, help alleviate the pharmacy faculty shortage, and potentially help alleviate the overall manpower shortage as more qualified pharmacists graduate from the increased number of colleges and schools. Subsequent to stabilizing the pharmacy workforce, it will remain important for administrators to be cognizant of significant factors identified in this study in order to attract and retain the most qualified faculty members.

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