RESEARCH ARTICLES

Assessing Career Aspirations of Pharmacy Students

Mark V. Siracuse, PharmD, PhD,[a] Stephen W. Schondelmeyer, PharmD, PhD,[b] Ronald S. Hadsall, PhD,[b] and Jon C. Schommer, PhD[b]

[a]Department of Pharmacy Sciences, Creighton University
[b]Department of Pharmaceutical Care and Health Systems, University of Minnesota

Objectives. The purpose of this study was to determine factors that influence the career aspirations of third-year pharmacy students given the students' educational environment, current work environment, and personal situation. Materialism, career commitment, shared class attitudes, and individual attitudes towards the institution were considered.

Methods. A survey was developed using literature sources and results from focus groups of fourth-year pharmacy students. Subsequently, students from 8 pharmacy schools completed the survey and viewed a videotape that visually portrayed and structured 3 broad career scenarios: direct patient care, indirect patient care, and drug distribution management.

Results. Survey results from 509 students were evaluated. Sixty-six percent and 71.1% of students chose direct patient care as their immediate and 10-year career aspiration, respectively. Career commitment, educational experience, and shared class attitude towards faculty members were all associated with at least 1 of the 3 career aspirations. Attitude about work experience, materialism, individual attitude towards the institution, and the other shared class attitudes were not associated with any of the career aspirations.

Conclusions. Approximately two thirds of the pharmacy students surveyed aspired to a career as a direct patient care pharmacist. Career commitment and educational experience were the main factors influencing these aspirations.

Keywords: career aspirations, direct patient care

INTRODUCTION

The focus of pharmacy practice and education has changed over the past decade. In the past, pharmacy practice and education were focused primarily on drugs and their distribution. The suggestion of pharmacy practice centered on the patient was first articulated by Hepler and Strand in 1990 as pharmaceutical care.[1] The concept of pharmaceutical care quickly became adopted by the profession. By the end of the 1990s, major pharmacy organizations and pharmacy educators embraced pharmaceutical care as the primary focus of pharmacists' activities.

Despite the rapid adoption and widespread acceptance of pharmaceutical care as the focus of pharmacy, the implementation of pharmaceutical care practice proved to be a major challenge. Even now, in the first decade of the 21st century, the implementation of pharmaceutical care is not widespread. There were scant reports of pharmacists performing direct patient care activities in the health-systems (hospital) settings and even fewer reports of this type of practice in ambulatory and community settings. For many pharmacists, there is a clear disconnect between what pharmacy leadership says pharmacists should be doing and the reality faced by practicing pharmacists on a daily basis.[2] By circumstance, pharmacy students are put squarely in the middle of this paradoxical situation—hearing one message from pharmacy leaders and educators and another message from working pharmacists. Many pharmacy students today have worked or are currently working in a pharmacy-related job. Pharmacy students hear about the importance of patient-centered care from faculty members and professional leaders, but these students usually face a very different reality when they work in a pharmacy. All too often students find themselves in a setting that is limited by older models of pharmacy practice.[3]

Many schools and colleges of pharmacy have adopted a patient-centered focus to their curriculum.[4] This is in contrast to previous pharmacy curricula that were primarily focused on the pharmaceutical product and to some degree on clinical pharmacy activities. As a result

Corresponding Author: Mark V. Siracuse, PharmD, PhD. Address: Assistant Professor, Department of Pharmacy Sciences, 2500 California Plaza, Omaha, NE 68178. Tel: 402-280-3722. Fax: 402-280-4809. E-mail: msiracuse@creighton.edu.

of the patient care movement in curricula, a change in teaching philosophy and style emerged during the 1990s. Examples of this include introducing patient-oriented training early in the pharmacy curriculum and increasing the amount of patient-contact clerkship time.[5]

Your Pharmacy Future: A Videotape

There is a readily apparent disconnect between the reality in most pharmacy practice settings today and the espoused mission of pharmacy education to prepare students for a future in pharmaceutical care. The Minnesota Pharmacists Association (MPhA) recognized this issue in 1997. To assist pharmacists and pharmacy students in understanding the alternative career paths they could choose, the MPhA Board of Directors decided to develop a videotape that clearly illustrated 3 basic pharmacy career directions for pharmacists: (1) direct patient care, (2) indirect patient care, and (3) drug distribution management. Consequently, the videotape, *Your Pharmacy Future*, was developed in 1999 as a collaborative effort between the University of Minnesota College of Pharmacy and the MPhA. Scenarios portrayed in *Your Pharmacy Future* were used to define future pharmacy practice to students participating in the current study. The 3 scenarios portrayed in the videotape are very similar to the pharmacists' roles outlined in the subsequently developed 2000–2001 Report of the Argus Commission.[6]

A career in direct patient care is portrayed in the video as a practice in which the pharmacist takes responsibility for a patient's drug-related needs and is held accountable for this commitment.[1] Essentially, this scenario presents a pharmacist practicing pharmaceutical care on a full-time basis. As examples of careers in indirect patient care, the video portrays pharmacists involved in formulary development, managed care operation and administration, and serving as clinical consultants to physicians and other health care providers in hospital and long-term care settings. Pharmacists in these careers often have very little, if any, direct contact with patients. However, the clinical and economic decisions they make and the services they provide to other health care providers and health plan administrators are highly valued. Finally, as an example of a career in drug distribution management, the video portrays pharmacists engaged in the immense daily challenges of dispensing large volumes of prescriptions, maintaining a profitable practice, and dealing with the increased expectations of third-party payers and patients.

Research Need

No study known to the authors in the pharmacy literature had attempted to assess factors that influenced pharmacy-student career choice in terms of conceptual career paths aspired to by the student. Previous studies tried to determine why students enter the pharmacy profession vs other professions. Other studies analyzed the type of job setting to which a student aspires, such as community retail pharmacy, hospital pharmacy, long term care pharmacy, etc. There was a need to study factors that impact pharmacy student career choice in 1 of the 3 conceptual areas of pharmacy illustrated in the videotape used in the current study. Additionally, this study attempted to assess the impact of what is often 2 ideologically distinct environments (academia vs work place) on pharmacy student career aspirations.

Finally, there was very little research on the socialization of a cohort of students as they progress through the professional program. Research needed to be done to determine how the "shared class attitudes" of a group of students ultimately leads to what many educators describe as a "class personality." The shared class attitudes of a group of students can ultimately influence the career aspirations of each individual student. The current study explored this area.

OBJECTIVES

The objective of this study was to determine the influence of various factors on pharmacy students' career aspirations. Pharmacy students were shown the videotape, *Your Pharmacy Future*, and then asked to indicate in which of the 3 career areas (direct patient care, indirect patient care, or drug distribution management) they intended to work primarily as a pharmacist. The research evaluated the impact of the following factors on the career choice of pharmacy students: (1) materialism, (2) career commitment, (3) individual attitude toward the college of pharmacy, (4) shared class attitudes regarding class leadership, faculty members, study habits, laboratory courses, didactic information, and class unification, (5) current and previous work experience, and (6) the educational experience. In addition, the research evaluated the impact of shared class attitudes on the educational experience.

METHODS
Instrument Development

The items contained in the study instrument were developed from a variety of sources including the focus group discussions of fourth-year PharmD students at the University of Minnesota College of Pharmacy; the sociologic and psychosociologic literature on materialism, career commitment, and organizational commitment; a single previous study on shared class attitudes of dental students; previous studies on pharmacist and pharmacy-student work experiences; discussions with faculty members and graduate students in the social and admin-

istrative pharmacy department at the University of Minnesota; informal discussions with pharmacy students and pharmacists; and the researchers' personal experiences working as a pharmacist and teaching pharmacy students. Items found in the literature were adjusted where appropriate to make them relevant to pharmacy students. All items in this study employed a 5-point Likert scale with anchors ranging from 1 = strongly agree to 5 = strongly disagree.

Materialism. The materialism scale originally developed by Ward and Wackman was used in this study.[7] The reliability of this scale has been provided in at least 2 studies.[7,8] Cronbach coefficient alpha have ranged from 0.64 to 0.71.[9] This scale emphasizes possessions and money as indicators of materialism and personal happiness.

Career commitment. Blau's original 8-item career commitment scale was incorporated into the survey used in this study.[10] The items used in the current study were almost identical to those used in another study of pharmacy students.[11] The internal consistency of this scale has been well documented in several studies. Reliability as measured by Cronbach coefficient alpha ranged from 0.82 to 0.92.[12-16]

Individual attitude towards the college or school of pharmacy. The scale used to assess individual attitudes toward the college or school of pharmacy was based upon the 15-item Organizational Commitment Questionnaire (OCQ) that was originally developed by Mowday.[17] The original OCQ was significantly altered so that it would be more appropriate and make sense to pharmacy students. For the current study, the "organization" was the college or school of pharmacy. Pharmacy students were asked to give their view of their school or college of pharmacy and its values. Five items on the original OCQ were omitted because it was believed they did not pertain to pharmacy students, but instead were more specific to a work environment. In previous studies, the internal consistency of the original OCQ as measured by Cronbach coefficient alpha ranged from 0.79 to 0.93.[17-26] An 8-item modified version of the original 15-item OCQ was developed by Jans, and demonstrated adequate internal consistency.[27] The instrument administered by Jans used 4 items directly from the original 15-item OCQ, combined with 4 items developed specifically by Jans for the population he studied. The internal consistency of the Jans instrument as measured by the Cronbach coefficient alpha was 0.81, demonstrating that the original 15-item OCQ could be modified and reliability maintained.[27]

Shared class attitudes. The scales used to assess shared class attitudes were based solely on an instrument that was developed to formally assess shared class attitudes that developed amongst a cohort of dental students.[28] Neither the reliability nor validity of this instrument had been tested. This section was divided into 6 separate parts as follows: (1) shared class attitude regarding class leadership, (2) shared class attitude regarding faculty, (3) study habits, (4) laboratory, (5) didactic information, and (6) class unification.

Attitude toward work experience. Eight items were used to measure student reaction and attitude about their current work experience. Items regarding student reaction and attitude about their current work environment were developed as a direct result of student feedback from the focus group discussions with fourth-year PharmD students at the University of Minnesota.

Educational experience. There were 9 items in this section. Students were instructed to refer to the 3 scenarios depicted in the videotape, *Your Pharmacy Future*, when answering these items. Survey items in this section were developed specifically for the current study. Student feedback from the focus group sessions with fourth-year PharmD students at the University of Minnesota contributed significantly to the development of items in this section.

Items based on *Your Pharmacy Future*. The videotape, *Your Pharmacy Future*, shows examples of 3 pharmacy career scenarios. Seventeen items were developed specifically for this section.

Study Implementation and Response

Study participants were required to complete the survey instrument (which was divided into 2 parts) and view a videotape about future pharmacy practice. The principal investigator (Siracuse) administered the survey instrument to study participants as a group at each college/school of pharmacy. Survey administration began with the distribution of 1 survey packet to each student. Survey packets contained: (1) a consent form for the written survey; (2) part one of the survey instrument with written instructions; (3) a written follow-up page to the videotape, *Your Pharmacy Future*; and (4) part 2 of the survey instrument with written instructions. Part 1 of the survey instrument, which did not pertain to the videotape, contained the following categories: demographics and individual background information; work experience; materialism; career commitment; individual attitude towards the college or school of pharmacy; and shared class attitudes. Part 2 of the survey instrument contained the survey items based on the videotape, *Your Pharmacy Future*, and items regarding student educational experience.

First, study participants were asked to read through the consent form for the written survey as required by the

Table 1. Response Rate and Useable Responses

School	Total Students in Class	Students Responding to Survey	Usable Survey Responses	Gross Response Rate (% of total responding)	Useable Response Rate (% of responses useable)	Net Useable Response Rate (% of total useable)
A	90	44	42	48.9	95.5	46.7
B	108	67	64	62.0	95.5	59.3
C	139	121	115	87.1	95.0	82.7
D	103	73	69	70.9	94.5	67.0
E	102	95	90	93.1	94.7	88.2
F	60	51	47	85.0	92.2	78.3
G	110	44	44	40.0	100.0	40.0
H	45	38	38	84.4	100.0	84.4
Total	757	533	509	70.4	95.5	67.2

Institutional Review Board (IRB) at the University of Minnesota. Next, study participants read the instructions for part 1 and completed the subsequent survey items. After completion of part 1, study participants watched the videotape, *Your Pharmacy Future*, which was projected onto a large movie screen. After the videotape was finished, study participants read the instructions for part 2 and completed the subsequent survey items. This procedure was repeated at all 8 colleges and schools of pharmacy.

All students in either the third year of a 4-year PharmD program (7 schools) or the fourth year of a 5-year PharmD program (1 school) were expected to participate in the research. Arrangements were made several months in advance with faculty members at each data collection site. Classrooms were reserved and exact timing was arranged to make the administration of the survey as convenient as possible for the students to enhance student participation. Whenever possible, students were surveyed during class time. In-class surveys were conducted at schools C, E, F, and for the initial survey at school D. Class time for administering the survey could not be arranged at schools A, B, G, and H, or for the second survey at school D. At these schools, students had to be recruited. A light meal (pizza and soft drinks) was used as an incentive to increase student participation.

Study participants were considered a convenience sample. At each of the 8 universities, much effort was expended in arranging to have all students at that school or college of pharmacy brought together into one group to view the videotape and complete the survey during the same time period. This method of surveying controlled for any procedural differences that might have occurred if each student was sent a videotape and a survey with instructions to take it home and complete it. More than likely, the response rate would have been lower if this alternative methodology had been used.

According to faculty contacts from each institution, there were a total of 757 possible students that could have participated in the current study from the 8 colleges and schools of pharmacy selected. Of this total, 533 students actually completed surveys, for an overall response rate of 70.4% (Table 1). Students from 8 different colleges and schools of pharmacy in the Midwest who were at the same point in the pharmacy curriculum at their respective schools were surveyed. Twenty-four surveys were dropped from the analysis because of incomplete data (Table 1). The final analytic set consisted of 509 pharmacy students, or 95.5% of the students surveyed.

RESULTS
Demographics

The average age of the respondents was 24.5 years, with a range of 23.3 years at school H to 26.2 years at school D (Table 2). By a 2 to 1 margin, the majority of respondents were female (Table 2). The highest percentage of female students was at school D, and the highest percentage of male students was at school F.

Immediate and Ten-Year Career Aspirations

After viewing the videotape, respondents were asked a series of questions about their career aspirations and educational experience. There were 2 items in this section that asked respondents to select 1 of the 3 areas posed in the videotape, *Your Pharmacy Future*. The items were:

1. Given a situation where salary, benefits, and work schedule are identical, and there are ample opportunities in all areas, which of the career scenarios portrayed in the videotape "*Your Pharmacy Future*" do you see yourself working in upon graduation from pharmacy school? (If you plan to do a residency or fellowship, consider where you will practice following your residency or fellowship).

Table 2. Demographics

School	Number of students	Average Age	Minimum Age	Maximum Age	Percent Female	Percent Male
A	42	24.1	21	42	69.0	31.0
B	64	25.0	22	36	62.5	37.5
C	115	23.8	21	35	73.0	27.0
D	69	26.2	22	45	76.8	23.2
E	90	24.3	21	54	58.9	41.1
F	47	24.7	22	46	57.4	42.6
G	44	24.6	22	37	61.4	38.6
H	38	23.3	22	30	76.3	23.7
All Schools	509	24.5	21	54	67.2	32.8

Table 3. Immediate and Ten-year Career Aspirations

School	Number of Students	Immediate Career Aspiration			10-Year Career Aspiration		
		Direct Patient Care	Indirect Patient Care	Drug Distribution Mgt	Direct Patient Care	Indirect Patient Care	Drug Distribution Mgt
A	42	78.6	16.7	4.8	83.3	11.9	4.8
B	64	71.9	14.1	14.1	81.3	10.9	7.8
C	115	67.0	17.4	15.7	63.5	29.6	7.0
D	69	66.7	15.9	17.4	68.1	23.2	8.7
E	90	64.4	21.1	14.4	67.8	23.3	8.9
F	47	59.6	23.4	17.0	76.6	17.0	6.4
G	44	59.1	20.5	20.5	65.9	18.2	15.9
H	38	57.9	28.9	13.2	76.3	23.7	0.0
All Schools	509	66.0	19.1	14.9	71.1	21.2	7.7

Mgt = Drug Distribution Management

      a. Direct patient care
      b. Indirect patient care
      c. Drug distribution management
    2. How about 10 years after graduation?
      a. Direct patient care
      b. Indirect patient care
      c. Drug distribution management
    Overall, the percentage of respondents selecting direct patient care as their immediate career aspiration was 66.0% (Table 3). The range was from 57.9% at school H to 78.6% at school A. Overall, the percentage of respondents selecting indirect patient care as their immediate career aspiration was 19.1% (Table 3). The range was from 14.1% at school B to 28.9% at school H. Overall, the percentage of respondents selecting drug distribution management as their immediate career aspiration was 14.9% (Table 3). The range was from 4.8% at school A to 20.5% at school G.

    The students' 10-year career aspirations were similar to their immediate career aspirations. Overall, the percentage of respondents selecting direct patient care as their 10-year career aspiration was 71.1% (Table 3). The range was from 63.5% at school C to 83.3% at school A. Overall, the percentage of respondents selecting indirect patient care as their 10-year career aspiration was 21.2% (Table 3). The range was from 10.9% at school B to 29.6% at school C. Overall, the percentage of respondents selecting drug distribution management as their 10-year career aspiration was 7.7% (Table 3). The range was from 0.0% at school H to 15.9% at school G.

Factor Analysis and Reliability Testing
    Data reduction using factor analysis of each scale followed by a reliability determination resulted in the following scales: (1) materialism, 4 items ($\alpha = 0.74$); (2) career commitment, 7 items ($\alpha = 0.87$); (3) individual attitude towards the college/school of pharmacy, 10 items ($\alpha = 0.90$); (4) shared class attitude regarding faculty, 3 items ($\alpha = 0.71$); (5) shared class attitude regarding study habits, 5 items ($\alpha = 0.68$); (6) shared class attitude regarding laboratory, 3 items ($\alpha = 0.69$); (7) shared class attitude regarding class unification, 2 items ($\alpha = 0.68$); (8) opinion of current work experience, 4 items ($\alpha = 0.73$); (9) direct patient care educational experience, 2

Table 4. Best Fit Regression Models on to Each Career Aspiration

Model 1 - Direct Patient Care Career Aspiration		
$R^2 = 0.167$; $F_{(3,505)} = 33.86$; $p < 0.001$		
Variable	**Standardized Beta**	***p* value**
Career Commitment	0.127	0.002
Direct Patient Care Educational Experience	0.307	< 0.001
Indirect Patient Care Educational Experience	-0.219	< 0.001
Model 2 - Indirect Patient Care Career Aspiration		
$R^2 = 0.13$; $F_{(3,503)} = 16.221$; $p < 0.001$		
Variable	**Standardized Beta**	***p* value**
Career Commitment	-0.084	0.049
Shared Class Attitude Regarding Faculty	0.103	0.015
Direct Patient Care Educational Experience	-0.103	0.014
Indirect Patient Care Educational Experience	0.343	< 0.001
Drug Distribution Management Educational Experience	-0.091	0.034
Model 3 - Drug Distribution Management Career Aspiration		
$R^2 = 0.18$; $F_{(3,503)} = 23.574$; $p < 0.001$		
Variable	**Standardized Beta**	***p* value**
Career Commitment	-0.093	0.027
Opinion of Current work Experience	0.168	< 0.001
Direct Patient Care Educational Experience	-0.125	0.002
Indirect Patient Care Educational Experience	0.118	0.005
Drug Distribution Management Educational Experience	0.321	< 0.001

items ($\alpha = 0.63$); (10) indirect patient care educational experience, 2 items ($\alpha = 0.81$) and; (11) drug distribution management educational experience, 2 items ($\alpha = 0.82$).[29] These 11 scales were used as predictor variables in subsequent regression analyses to determine factors that were significant for pharmacy students when choosing career aspirations. Shared class attitude regarding class leadership and shared class attitude regarding didactic information were not reported here because these sets of scale items were not reliable.

In addition, 3 scales were developed for each of the career aspirations. Factor analysis and reliability determination resulted in the same 2-item scales for each careers aspiration. Reliability for each of these scales was determined as follows: (1) direct patient care career aspiration ($\alpha = 0.74$); (2) indirect patient care career aspiration ($\alpha = 0.77$); (3) and drug distribution management career aspiration ($\alpha = 0.80$).

Regression Analysis With Career Aspirations as Dependent Variable

Three separate multiple linear regressions were performed for each of the career aspirations to determine predictor variables that had direct effect. First, predictor variables associated with the direct patient care career aspiration were determined. All 11 predictor variables identified above were regressed against direct patient care career aspirations.[29] Stepwise regression using backwards elimination of predictor variables dropped all variables except (1) career commitment, (2) direct patient care educational experience, and (3) indirect patient care educational experience (Table 4).

A second multiple linear regression was performed to determine predictor variables associated with the indirect patient care career aspiration. Again, all 11 predictor variables were regressed against indirect patient care career aspirations. Stepwise regression using backwards elimination of predictor variables dropped all predictor variables except (1) career commitment, (2) shared class attitude regarding faculty members, (3) direct patient care educational experience, (4) indirect patient care educational experience, and (5) drug distribution management educational experience (Table 4).

A third multiple linear regression was performed to test which predictor variables were statistically associated with drug distribution management career aspiration. Once again, all 11 predictor variables were regressed against drug distribution management career aspiration. Stepwise regression using backwards elimination of predictor variables dropped all variables except (1) career commitment, (2) opinion of current work experience, (3)

Table 5. Best Fit Regression Model on to Each Educational Experience

Model 1 - Direct Patient Care Educational Experience		
$R^2 = 0.08$; $F(1,507) = 41.208$; $p < 0.001$		
Variable	**Standardized Beta**	***p* value**
Shared Class Attitude Regarding Laboratory	0.274	< 0.001
Model 2 - Indirect Patient Care Educational Experience		
$R^2 = 0.01$; $F(1,507) = 4.871$; $p = 0.028$		
Variable	**Standardized Beta**	***p* value**
Shared Class Attitude Regarding Laboratory	0.098	0.028
Model 3 - Drug Distribution Management Educational Experience		
$R^2 = 0.01$; $F(1,507) = 7.447$; $p = 0.007$		
Variable	**Standardized Beta**	***p* value**
Shared Class Attitude Regarding Study Habits	0.120	0.007

direct patient care educational experience, (4) indirect patient care educational experience, and (5) drug distribution management educational experience (Table 4).

Regression Analysis of Educational Experience on to Shared Class Attitudes

The last group of analyses entailed 3 separate multiple linear regressions performed using educational experience as the dependent variable. First, the 4 shared class-attitude predictor variables identified above were regressed against the dependent variable, direct patient-care educational experience. Stepwise regression using backwards elimination of predictor variables dropped all variables except shared class attitude regarding laboratory (Table 5).

A second multiple linear regression analysis was performed to determine which shared class attitude predictor variables were associated with the indirect patient career educational experience. The 4 shared class attitude predictor variables were regressed against the dependent variable, indirect patient care educational experience. Stepwise regression using backwards elimination of predictor variables dropped all variables except shared class attitude regarding laboratory (Table 5).

A third multiple linear regression analysis was performed to determine which shared class attitude predictor variables were associated with the drug distribution management educational experience. The 4 shared class-attitude predictor variables were regressed against the dependent variable, drug distribution management educational experience. Stepwise regression using backwards elimination of predictor variables dropped all variables except shared class attitude regarding study habits (Table 5).

Limitations

Limitations to this study were in the following areas: (1) study design issues, (2) variable exclusion, and (3)

measurement error. The study design limitation involved the population from which the sample was drawn. Survey respondents were drawn from 8 colleges and schools of pharmacy in the Midwestern United States. The selection of the 8 sites was based on their relative proximity to the principal investigator who was a graduate student at the University of Minnesota in Minneapolis, MN, at the time of the study. As was mentioned in the study implementation, the principal investigator administered the survey and presented the videotape to students at all 8 colleges and schools of pharmacy. This type of control over the study's protocol ensured uniformity in the data collection process and resulted in a good response rate (Table 1). Since the protocol limited the number of data collection sites, the findings from this study may have limited generalizability. In other words, it is possible that pharmacy students in other parts of the country have different experiences than pharmacy students in the Midwest. An alternative study design would have been to administer the survey to pharmacy students throughout the country. For instance, students could have been randomly selected from each college or school of pharmacy. A copy of the survey and videotape could have been mailed to each student with clear written instructions. This alternative was not selected for 3 reasons: (1) study participants may not have followed the exact sequence of survey administration and videotape viewing (loss of control over the study protocol), (2) budgetary constraints for videotape replication and mailing costs, and (3) greater likelihood of a smaller response rate using this alternative. After taking everything into consideration, the current study's protocol was determined to be the best way to maximize resources and obtain a reasonable response rate from pharmacy students at multiple institutions.

Another study design issue that may impact the results is the method of student recruitment at the 8 participating colleges and schools of pharmacy. Some of the schools

allowed the survey to take place during class time. Other schools required special arrangements to bring students together between classes. These special arrangements included a light meal for the students in order to increase their participation. In most schools where the survey was administered between classes, the gross response rate was low compared with schools where the survey was administered during class time. This difference in response rate may mean there was bias in the student selection process for this study, even though all students were encouraged and welcome to participate.

A second limitation is the possible exclusion of important variables from the survey instrument. Predictor variables determined in the current study at best explained only approximately 18% of the career aspiration variables (Table 4). While this study provides important insights into pharmacy student career aspirations, there must be other factors that have significant influence. For instance, one area not studied was the psychology of pharmacy students, which could help determine whether there are personality differences that might explain why pharmacy students choose a particular career aspiration. An entire study could have been done on this area alone. One of the major complications of doing a personality test is the proprietary nature of these tests (eg, Myers-Briggs personality test). These tests usually require a trained psychologist to administer and analyze them, resulting in considerable expense. A psychological analysis would have been cost prohibitive and thus impractical for the current study. Exclusion of these and any other important variables that were not measured may have led to inappropriate conclusions.

Finally, the possibility of measurement error should be considered. As previously explained in the instrument development section, reliability and validity have already been demonstrated for the established instruments. This included the instruments used to measure materialism, career commitment, and individual attitude towards the college of pharmacy. However, pharmacy students may have something unique that could make these measures less valid than they were in previous research, which may have led to measurement error. Reliability and validity for other instruments used in this study were not previously established. This included the instruments used to measure shared class attitudes, opinion of work experience, career aspirations, and educational experience. Analysis completed in the current study established the reliability of these instruments. However, the validity of these instruments to actually measure what they are supposed to measure was not established, which may have been another source of measurement error.

DISCUSSION

The passion that drove this study was an apparent disconnect between the reality in most pharmacy practice settings today and the espoused mission of pharmacy education to prepare students for future careers in direct patient care. Specifically, this study focused on a paradox faced by pharmacy students, who often find it difficult to reconcile the realities of distribution-based pharmacy with their aspirations for a career in pharmaceutical care. Students who participated in this research were given the opportunity to choose between 3 possible career aspirations. An overwhelming majority of students (between 58% and 83%) selected direct patient care (which had characteristics similar to pharmaceutical care) as both an immediate and 10-year career aspiration. By contrast, a relatively modest number of students (between 0% and 20%) aspired to a career in which their primary responsibility would be drug-distribution management. The third choice, indirect patient care, ended up between the other 2 (ranging from 11% to 30%), but the number of students choosing this option was still modest in comparison to the number choosing direct patient care. These results are intriguing because they were similar at all 8 colleges and schools of pharmacy. Apparently, by the time pharmacy students are almost ready to start their experiential rotations, many of them have been influenced by pharmacy educators to aspire to a career that is patient focused rather than product focused. In other words, pharmaceutical care practice as a career aspiration was preferred over indirect patient care and drug dispensing and distribution by most students.

The results of this study suggest that career commitment and educational experience have the most influence over student career aspirations. Career commitment was positively associated with direct patient-care career aspirations. Conversely, career commitment was negatively associated with both indirect patient-care career aspirations and drug-distribution career aspirations. It is reasonable to conclude from these findings that pharmacy students who are more committed to their careers as future pharmacists would be more likely to choose a career as a direct patient-care pharmacist. Also, pharmacy students who are not as committed to their careers as future pharmacists are more likely to choose a career in either indirect patient care pharmacy or drug distribution management. In summary, most pharmacy students wanted to work as direct patient-care pharmacists, and had a high level of career commitment to their chosen profession.

Career commitment was the human factor most associated with student career aspiration in the current study. Career commitment has previously been shown to impact pharmacist's career choice and pharmacy stu-

dents. In a previous study, career commitment was found to have the strongest effect on the intention of pharmacists to withdraw from the pharmacy profession.[30] Another study also found that career commitment was relatively high in pharmacy students while they were still in school,[14] but often dropped only a few years after students graduate and begin practicing pharmacy.[31]

Educational experience was also associated with each of the career aspirations portrayed in the current study. In fact, educational experience had the highest magnitude of association with each of the career aspiration scenarios. As might be expect, each of the career aspiration scenarios had a positive association with a similar educational experience. In other words, direct patient care career aspiration was positively associated with direct patient care educational experience. Indirect patient care career aspiration was positively associated with indirect patient care educational experience. Drug distribution management career aspiration was positively associated with drug distribution management educational experience. Reiterating a previous observation, over two thirds of the students surveyed selected direct patient care as their ideal career aspiration. Given the magnitude of the association it is reasonable to conclude that a substantial influence on this aspiration came from student educational experience.

There were several negative relationships ascertained between educational experience and career aspirations. Indirect patient care educational experience was negatively associated with direct patient care career aspirations. Direct patient care and drug distribution management educational experiences were both negatively associated with indirect patient care career aspirations. Direct patient care educational experience was negatively associated with drug distribution management career aspirations. From these findings, it is reasonable to conclude that students who felt they had a strong direct patient care educational experience were more likely to have unfavorable responses to careers in indirect patient care and drug distribution management. Likewise, students who felt they had a strong drug distribution management educational experience were likely to have unfavorable responses to careers in indirect patient care. Students who felt they had a strong indirect patient care educational experience were likely to have unfavorable responses to careers in direct patient care. Finally, an interesting finding was that indirect patient care educational experience was positively associated with drug distribution management career aspirations.

Besides career commitment and educational experience, which were associated with all 3 career aspirations portrayed, 2 other factors were also associated with at least 1 of the career scenarios. First, the opinion of current work experience had a positive association with drug distribution management career aspirations. This result can be linked to the survey question that asked students to allocate the amount of time they spent in various activities in their current pharmacy work experience. Students indicated that they spent 69% of their time involved with drug distribution management activities. This was by far the most prevalent work activity for students. A possible explanation for this was that students who had a positive opinion regarding their current work experience (where they were mostly involved with dispensing and drug distribution management activities) would look favorably upon a career in drug distribution management. A second factor associated with only one of the portrayed career aspirations was shared class attitudes regarding faculty. This was positively associated with indirect patient care career aspirations. Students who had a positive view of shared class attitude regarding faculty were more likely to have a favorable response toward career aspirations in indirect patient care pharmacy. One possible explanation for this is that by the time pharmacy students reached the end of their third professional year, many had interfaced extensively with clinical faculty who were mainly involved with indirect patient care activities in their clinical practice. These faculty members may have had a positive influence on their students, which caused them to aspire to careers that are mainly focused on indirect patient care.

The idea of a shared class attitude being associated with student career aspirations was also considered. Of the 4 shared class attitude scales that were determined to be reliable, only shared class attitudes regarding faculty was associated with any of the career aspirations. The other 3 shared class attitude factors did not have any significant association with any of the career aspirations portrayed. This finding suggests either that shared class attitudes are not a significant influence in the career aspirations of students or that the scales used to measure the various shared class attitude factors need improvement. The latter argument is more likely. The reliability of the shared class attitude scales were relatively weak (Cronbach's α ranging from 0.68 to 0.71). Further work is necessary to refine these scales and improve their reliability and validity.

Educational experience was a key area of interest in this study. Further investigation is warranted to determine the impact of shared class attitudes on student educational experience. Two shared class attitudes factors were associated with educational experience: shared class attitude regarding laboratory and shared class attitude regarding
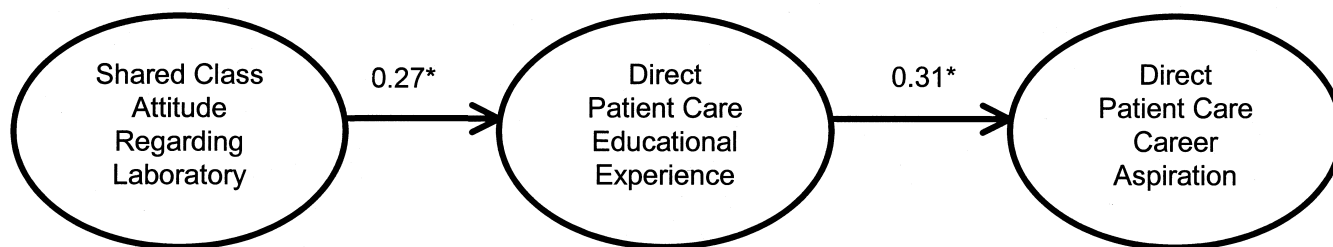
Figure 1. Direct patient care path analysis. *Standardized beta coefficient statistically significant, $\alpha \leq 0.05$
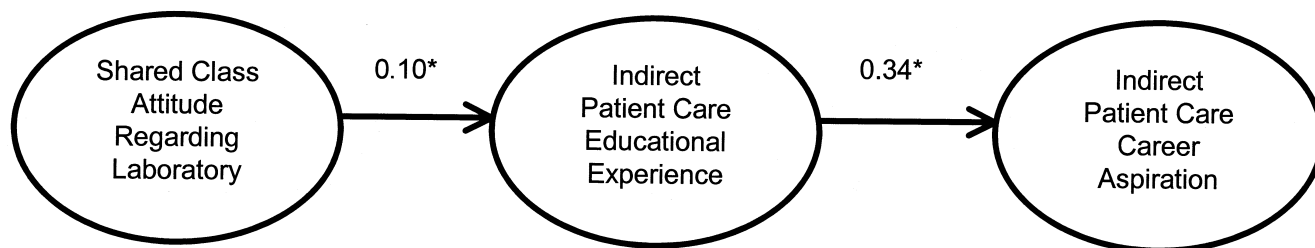

Figure 2. Indirect patient care path analysis. *Standardized beta coefficient statistically significant, $\alpha \leq 0.05$

Figure 3. Drug distribution mangement path. Mgt= Management. *Standardized beta coefficient statistically significant, $\alpha \leq 0.05$

study habits. First, shared class attitudes regarding laboratory was positively associated with both direct patient care and indirect patient care educational experience. In fact, the magnitude of the association between shared class attitudes regarding laboratory and direct patient care educational experience was relatively large (Table 5). From these results, it is clear that student laboratory experience can have a significant indirect impact on their career aspirations, especially with direct patient care and indirect patient care. This relationship was mediated through the educational experience. Viewed as a path analysis, positive shared class attitude regarding laboratory had a positive impact on both direct patient care and indirect patient care educational experiences. This led to a positive view of career aspirations in both direct patient care and indirect patient care pharmacy, respectively (Figures 1 and 2). A possible explanation for these findings is that students may have viewed laboratory experience as a connection between academia and pharmacy practice. Laboratory experience gave students a chance to practice pharmacy in a simulated learning environment. A positive laboratory experience may indirectly

influenced student career aspirations as a part of the overall educational experience. This was especially true for those students aspiring to careers in direct patient care pharmacy. A similar situation exists for students aspiring to careers in indirect patient care pharmacy, but to a lesser magnitude.

Finally, shared class attitudes regarding study habits was positively associated with drug distribution management educational experience. These results suggest that shared class attitudes regarding study habits have an indirect impact on drug distribution management career aspirations. This relationship was mediated through the educational experience. Viewed as a path analysis, positive shared class attitude regarding study habits had a positive impact on drug distribution management educational experience. This led to a positive view of drug distribution management career aspirations (Figure 3).

CONCLUSIONS

Pharmacy students often find it difficult to reconcile the realities of distribution-based pharmacy with the future hope of pharmaceutical care. Pharmacy educators need to understand how this disconnect is experienced

by their students, and help them find ways to make their career aspirations a reality. This study demonstrates how much pharmacy students are influenced by their educational environment. Today, most pharmacy curriculums point students towards a direct patient care model of practice, and consequently this is what many of them aspire to. In addition, most pharmacy students have a relatively high level of career commitment. This characteristic is positively associated with aspirations for a career in direct patient care. Unfortunately, the pharmacy work environment is more often then not seen as being disconnected from what students learn in pharmacy school. Therefore students should not only be taught about a pharmacy practice focused on direct patient care, they need to learn how to become change agents in work environments that are apparently resistant to change.

Pharmacy students need to be realistic about the profession they have chosen to spend their career in. Some students may have chosen pharmacy as a career because their vision of pharmacy is that of a professional who seems somewhat detached from his or her patients. These students and prospective students may see a profession that is focused on drug products rather than patients. Once these students enter the pharmacy curriculum they may be shocked to find out that the profession is actually headed away from a product focus and toward a patient focus. They may see this situation and choose to accept it, rebel against it, or become confused by it. Students need to be prepared for this paradox in advance so they do not get frustrated with their education, the faculty teaching them, and the profession they are entering. On the other hand, there may be students who are aware of the changes that are taking place in the profession. These students may adapt more readily to contemporary pharmacy curriculums. They may also find more satisfaction with a patient-focused environment, and may ultimately have more success in their careers.

What else can be concluded from this research? There is much more work left to be done to understand pharmacy student career aspirations. Further investigations need to be conducted to understand other factors impacting pharmacy student career aspirations.

ACKNOWLEDGEMENTS

REFERENCES

1. Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm*. 1990;47:533-543.
2. Odedina FT, Segal R, Hepler CD, Lipowski E, Kimberlin C. Changing pharmacists' practice pattern. *J Soc Admin Pharm*. 1996;13:74-88.
3. Chewning B. Patient involvement in pharmaceutical care: a conceptual framework. *Am J Pharm Educ*. 1997;61:394-401.
4. American Association of Colleges of Pharmacy. Minutes of the AACP Board of Directors meeting: February 26-27, 1992, Amelia Island Plantation, Florida. *Am J Pharm Educ*. 1992;56:40S-43S.
5. Beck DE, Thomas SG, Janer AL. Introductory practice experiences: A conceptual framework. *Am J Pharm Educ*. 1996;60:122-131.
6. Cohen JL, Kabat HF, Koda-Kimble MA, Rutledge CO, Smith RE. Are we delivering on our promise to society to assure the safe use of medications? Educating pharmacists to continue adding value to health care. Report of the 2000-2001 Argus Commission. *Am J Pharm Educ*. 2001;65:6S-8S.
7. Ward S, Wackman D. Family and media influences on adolescent consumer learning. *Am Behav Scientist*. 1971;14:415-427.
8. Cline RR, Mott DA, Schommer JC. Relationship between attitudes, demographics, and application decisions among pre-pharmacy students: An exploratory investigation. *Am J Pharm Educ*. 1999;63:394-401.
9. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika*. 1951;16:297-334.
10. Blau GJ. The measurement and prediction of career commitment. *J Occup Psych*. 1985;58:277-288.
11. Rascati KL. Career choice, plans, and commitment of pharmacy students. *Am J Pharm Educ*. 1989;53:228-234.
12. Blau GJ. Further exploring the meaning and measurement of career commitment. *J Vocational Behav*. 1988;32:284-297.
13. Blau GJ. Testing the generalizability of a career commitment measure and its impact on employee turnover. *J Vocational Behav*. 1989;35:88-103.
14. Ortmeier BG, Wolfgang AP, Martin BC. Career commitment, career plans, and perceived stress: A survey of pharmacy students. *Am J Pharm Educ*. 1991;55:138-142.
15. Kong SX. Predictors of organizational and career commitment among Illinois pharmacists. *Am J Health Syst Pharm*. 1995;52:2005-2011.
16. Gaither CA. Career commitment: A mediator of the effects of job stress on pharmacists' work-related attitudes. *J Am Pharm Assoc*. 1999;39:353-361.
17. Mowday RT, Porter LW. The measurement of organizational commitment. *J Voc Behav*. 1979;14:224-247.
18. Aranya N, Kushnir T, Valency A. Organizational commitment in a male-dominated profession. *Hum Relat*. 1986;39:433-448.
19. Blau GJ. Job involvement and organizational commitment as interactive predictors of tardiness and absenteeism. *J Manage*. 1986;12(4):577-584.
20. Lachman R, Aranya N. Evaluation of alternative models of commitments and job attitudes of professionals. *J Occup Behav*. 1986;7:227-243.

21. Blau GJ. Using a person-environment fit model to predict job involvement and organizational commitment. *J Vocational Behav*. 1987;30:240-257.

22. Morrow PC, McElroy JC. Work commitment and job satisfaction over three career stages. *J Vocational Behav*. 1987;30:330-346.

23. DeMicco FJ, Olsen MD. The relationship of work satisfaction and organizational commitment to retirement intention. *J Am Diet Assoc*. 1988;88:921-927.

24. Sneed J, Herman CM. Influence of job characteristics and organizational commitment on job satisfaction of hospital food service employees. *J Am Diet Assoc*. 1990;90:1072-1076.

25. Kong SX, Wertheimer AI, McGhan WF. Role stress, organizational commitment and turnover intention among pharmaceutical scientists: a multivariate analysis. *J Soc Admin Pharm*. 1992;9(4):159-171.

26. Lee V, Henderson MC. Occupational stress and organizational commitment in nurse administrators. *J Nurs Admin*. 1996;26(5):21-28.

27. Jans NA. Organizational commitment, career factors and career/life stage. *J Organ Behav*. 1989;10:247-266.

28. Lancaster DM, Gardiner JF, Strother EA, Boozer CH. Dental students' class attitudes: a four year study. *J Am Coll Dent*. 1989;56(4):30-35.

29. Graduate Pack SPSS. version 10.0. Chicago, Ill: SPSS; 1999.

30. Gaither CA, Mason HL. A model of pharmacists' career commitment, organizational commitment, and career and job withdrawal intentions. *J Soc Admin Pharm*. 1992;9(2):75-86.

31. Wolfgang AP, Ortmeier BG. Career commitment, career plans, and job-related stress: a follow-up study of pharmacy students as pharmacists. *Am J Pharm Educ*. 1993;57:25-28.