Effect of a Continuous Community Pharmacy Practice Experience on Student Attitudes, Motivation, and Communication Skills

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The Community Pharmacy Practice Experience, a two-year longitudinal experience for students, was guided by six self-directed learning modules designed to: (i) stimulate interest in community pharmacy; (ii) motivate learning by demonstrating the applicability of didactic course work in contemporary practice; (iii) promote professionalism; and (iv) develop communication and psychosocial skills in a holistic approach to pharmacy care. The purpose of this report is to describe the effect of the experience on student attitudes and communication skills. Based on attitudes measured using an instrument specifically designed for this study, there were no statistically significant changes in attitudes related to community clinical practice, motivation to learn, and professionalization. Administration of the Schack-Hepler Instrument also failed to detect changes in attitudes related to professionalization. Insufficient power probably contributed to these findings. Recommendations for measuring outcomes of future longitudinal practice experiences are provided.

INTRODUCTION

For a variety of reasons, many health professions have designed longitudinal clinical experiences that integrate with traditional didactic instruction. In Background Paper II(1) the Commission to Implement Change advocates that “professional pharmacy students learn in school in the same manner in which they will learn throughout their careers” and suggests that one way to inculcate students with critical thinking and lifelong learning skills is to introduce them into a practical environment early in their curriculum. In medical education, longitudinal experiences have been introduced into curricula to alter students’ perceptions of specific areas of practice such as home visitation(2), geriatric care(3,4), family holistic medicine(5,6), and rural and primary care medicine(7-9). Others in medical education have introduced these longitudinal experiences to unify basic and clinical sciences(9-12) as well as promote independent learning(8). Still others have offered longitudinal experiences in an attempt to provide insights into comprehensive health care delivery(7,8,13), improve communication and interpersonal skills(7,14), and to improve professional socialization(11).

Descriptions of longitudinal experiences in pharmacy and nursing education are less common in the literature. Educators in nursing have used longitudinal experiences to foster professional teamwork(15). The goal of one very limited early clinical instructional experience in pharmacy was to identify career options and demonstrate practical applications of didactic material(16). Although theoretically sound, there are little data demonstrating that longitudinal programs can achieve these goals.

1 This project was supported by the SmithKline Beecham Foundation Grant through the American Association of Colleges of Pharmacy.
The goal of this project was to implement and evaluate a longitudinal practice experience during which Auburn School of Pharmacy students cared for a patient-family under the supervision of a pharmacy practitioner and a faculty advisor. The objectives for this longitudinal Community Pharmacy Practice Experience (CPPE), were based upon the experience of medical, nursing, and pharmacy educators. Specifically, the objectives of this project were to:

1. to stimulate student interest in clinical community pharmacy practice (initiating pharmaceutical care in the community pharmacy setting);
2. motivate student learning by demonstrating the applicability of didactic course-work in community pharmacy practice;
3. promote professional socialization of students; and
4. encourage the development and utilization of communication skills by students.

METHODS

This two-year program, designed to provide a continuous practice experience in community pharmacy practice, has been described in an earlier publication(17). Each student was assigned a Pharmacist Preceptor, a Faculty Advisor, and a Patient Family with whom they interfaced during each of the first six quarters (two years) of a three year professional program. At the time this project was implemented, the first six quarters of the curriculum were devoid of clinical experience and consisted of basic sciences taught predominantly in a lecture format.

Pharmacists considered to be good role models were recruited by letter and personal contact. Those demonstrating an interest and commitment were invited to a breakfast seminar during which the program was specifically discussed. One of the first responsibilities of the Pharmacist Preceptor was to recruit a Patient Family for the project.

Patient families considered suitable were those having one or more of the following characteristics: at least one member taking more than five medications or more than twelve doses of medication per day, an elderly person, an infant, or a member difficult to educate. Patients were provided with an informational pamphlet describing the program and asked to grant informed consent.

The program was described to all students entering Auburn University School of Pharmacy in September 1991. In the class of 100 students, 36 volunteered to participate in the program. Of the 36, 16 were randomly assigned to participate in the program; 20 served as the control group.

Students were assigned to a Pharmacist Preceptor, a Faculty Advisor, and a Patient Family. All study participants with the exception of the Patient Family received an assignment manual, prepared expressly for this pilot experiential program which consisted of learning assignments and self-assessment materials. Each quarter the students completed pre-assignment materials, met with their Pharmacist Preceptor, interacted with their Patient Families, completed assignments and self-assessments, and met with their Faculty Advisor.

To evaluate the program, student attitudes about the viability of clinical practice in the community setting, motivation to learn, and professionalism were measured at baseline and at the end of year two in both the study and control groups. As one measure of their communication skills, the grade received in a required communication course by subjects in the study group was compared to that of the control group. The overall Grade Point Averages (GPA’s) of both groups were also compared. Attitudes of the patient families about the role of a pharmacist were measured both at baseline and at the end of the program using the questionnaire. The reliabilities of both the Auburn Instrument and the Schack-Hepler Professional Socialization Instrument were also estimated. The instruments have been validated using practicing pharmacists. The content validity of the Auburn Instrument was based on the work of Bucher and Stelling who characterized the developmental process of becoming an idealistic professional pharmacist (19).

Prior to implementation of the CPPE, the validity of the Auburn Instrument was established. Four faculty evaluated the content validity of the Auburn Instrument by rating how strongly they believed each item measured the intended dimension. Evidence of content validity was considered present if all four faculty agreed or strongly agreed that the item measured the intended dimension.

The reliabilities of both the Auburn Instrument and the Schack-Hepler Instrument were also established prior to implementation of the CPPE. Using a cross-sectional sample of 208 first-, second-, and third-year BS pharmacy students, Cronbach’s Coefficient Alpha for each instrument(21,22). The Coefficient Alpha for the Schack-Hepler and Auburn Instruments were 0.55 and 0.69 respectively.

Data Analysis. Baseline and postintervention ratings of the Auburn Instrument and the Schack-Hepler Instrument were also implemented to multivariate analysis of covariance (MANCOVA), since it has been advocated as the most powerful method of evaluating paired pretest and posttest data(21,22). This multivariate procedure allowed us to simultaneously evaluate multiple dependent variables (i.e., factor score means of a scale) while controlling the probability of making a Type I error.

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Sources of error in such a pre-post study design include differences in baseline scores between groups and within groups. MANCOVA controls for these sources of error by using the posttest scores as covariates. A covariate (i.e., preintervention mean score) adjusts the posttest mean to
what it would have been had all groups started with equal pretest means.

Two separate MANCOVA procedures were performed to analyze the ratings of the Auburn Instrument and the Schack-Hepler Instrument. In the MANCOVA of the Auburn Instrument, the dependent variables were the poststudy mean scores of three scales comprising this instrument and the covariates were the corresponding three baseline scores. This procedure assessed whether the postintervention ratings of the Schack-Hepler Instrument were different between the two study groups, the second MANCOVA analysis was conducted in the same manner.

The study group’s mean grade achieved during a required communication course was compared to that of the control group using the student’s t-test. Using the same statistical procedure, the overall GPA’s of the study and control groups were compared.

The paired t-test was used to compare patient family attitudes about the role of the pharmacist. All data analyses were performed using SPSS for Windows Release 6.0 (22-23). The a priori P-value was established at P<0.05.

RESULTS

Population Characteristics. Of 36 student volunteers, 16 were randomly assigned to participate in the study and 20 served as controls. There were no statistically significant differences between the control and study groups with regard to age at entry to the program and prepharmacy GPA. Gender and the number of students having prepharmacy work experience were also not statistically different between the groups (Table I).

Attitude Changes. After adjusting the postintervention scores for differences in baseline scores, the attitudes of the study and control groups were not statistically different with respect to attitudes toward clinical practice in the community, motivation to learn, and development of professional attitudes (Table II). Based upon the scores of the Schack-Hepler Professional Socialization Instrument, the extent of professional socialization between the control and study groups was also not statistically different (Table III).

<table>
<thead>
<tr>
<th>Scale</th>
<th>Baseline Mean (SD)b</th>
<th>Post-study rating meanb</th>
<th>Adjusted meanb</th>
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<tr>
<td>Professional Socialization</td>
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<td></td>
<td></td>
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<td>Study</td>
<td>3.19 (0.73)</td>
<td>3.64 (0.77)</td>
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<tr>
<td>Control</td>
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<tr>
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<td>1.83 (0.28)</td>
<td>1.74</td>
</tr>
<tr>
<td>Control</td>
<td>2.00 (0.66)</td>
<td>2.25 (0.62)</td>
<td>2.35</td>
</tr>
</tbody>
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Pillais=0.25, df=3,16, P=0.21.

aSee Appendix B.
bS = strongly agree; 1 = strongly disagree. This scale was reversed for the items of motivation.

Communications Course Grades. There was no statistically significant difference between the grades of the study and control group students in a required communications course. (t=1.6, df=20, P=0.12)

Overall Pharmacy School GPA. The difference in the overall Pharmacy School GPA of the study and control groups was also not statistically significant, (t=1.27, df=29, P=0.21)

Patient Attitudes. Based upon the responses from the questionnaire in Appendix A, there were no statistically significant changes in patient family attitudes from baseline to the end of the program.

DISCUSSION

Because there were no statistically significant differences in the attitudes of the study and control groups at the end of the study interval, a post-analysis was done to ascertain whether there was sufficient power to detect a change. Power is the probability of making the right decision and is dependent on three primary factors: (i) alpha; (ii) sample size; and (iii) effect size. Alpha is the probability of rejecting the null hypotheses when it is true (Type I error). This is usually set at 0.05 by most researchers(21). The effect size is the extent to which the groups differ in the population on the dependent variable. If the effect size is characterized as small, there will be only a small difference in population variables and a large group size is needed to detect significant differences(21,22). The MANCOVA power analysis of the Auburn Instrument revealed an effect size of 0.24 and an observed power of 0.36. For the Schack-Hepler Instrument the effect size was 0.29, and the observed power was 0.26.
Using the Power Tables cited by Stevens(22), we probably needed 20 to 25 subjects in each study group to have sufficient power to demonstrate a change in attitudes using the Auburn Instrument. For the Schack-Hepler Instrument, 40 to 50 subjects in each group were probably needed to detect a change in attitudes. Since it is much harder to demonstrate a statistical difference with MANCOVA than with univariate analysis, the lack of any statistical differences in attitudes between the two groups may have been caused by a Type II error. However, had a univariate analysis been used, the likelihood of a Type I error would have been high.

Though no statistically significant differences in student attitudes could be demonstrated, several trends in the data were observed by visual inspection of the data. Students' scores on the motivation scale of the Auburn Instrument predicted how they scored on the same scale at the end of the study. Students who were more highly motivated initially maintained this level of motivation throughout the study period. Baseline scores of the clinical practice and professionalism scales, did not predict the scores on these two scales at the end of the study period. This may have occurred because attitudes toward clinical practice and professionalism may have gone up, down, or both during the program.

Though no differences in attitudes were identified between the control and study groups at either the beginning or end of the study, no negative effects of the program were observed during the study period. The program was well accepted by students, faculty advisors, and pharmacist preceptors; many felt that the program should be continued on a modified basis. These modifications are described in an earlier paper(17). Although the two attitudinal instruments did not elicit any difference between the study and control groups, the written comments by many preceptors indicated that students gained clinical skills, communication skills, confidence, and improved professional demeanor during their experience(17).

No published studies have specifically attempted to stimulate interest or alter attitudes toward the clinical practice possibilities in community pharmacy. Other educational projects, however, have been designed to alter student attitudes through specific clinical coursework. An abbreviated clinical experience (two days per week for 14 weeks) during the 1970s did not alter students’ attitudes toward the work characteristics of pharmacy(24). The effects of longer clinical programs in pharmacy on student attitudes have not been evaluated, but in medicine longer programs have been examined. Although lacking control groups and other experimental study design attributes, early practice experiences in medical or nursing education(2,3,5,6,15) have demonstrated that clinical interest is stimulated by community health care practice experiences irrespective of the health care discipline. Boling(2) instituted a longitudinal physician home visitation (housecall) service into a primary care internal medicine residency program. Though prior attitudinal scales are unavailable for comparison, the authors noted that most primary care physicians do not make home visits. Following the one or two year program, questionnaires revealed that 83 percent of the participating residents would make home visits in their future private practice. All residents reported changes in other attitudes as well such as consideration of quality of life, greater awareness of caregiver burden, and increased need for flexibility in tailoring medical regimens to meet home needs. Medical students rotating through a live-in geriatric facility informally rated the clinical experience as excellent, and new and positive attitudes towards geriatric care were stimulated(3). These studies indicate that though short-term clinical experiences may not effect students’ attitudes, longitudinal programs may. Because of these findings, the CPPE was designed to measure the attitudinal changes in a long-term (two year) clinical community experience. Though we were unable to demonstrate a statistically significant difference between the attitudes in the control and study groups, a larger study group may have been able to do so.

Our second goal of the study was to motivate learning by demonstrating the applicability of didactic course work to community pharmacy practice. Learning activities were designed to correspond as closely as possible with concurrent didactic coursework. For example, to integrate the project with mammalian physiology and biochemistry being taken in concurrence with the second module, the student was asked to identify the biochemical pathways in the body which affected the mechanism of action, excretion, or potential toxicity of a drug which their patient was taking. While taking a professional communications course, our students provided counseling for their patients.

Medical educators have also designed longitudinal clinical programs to accomplish this goal(9,11,25). Pittman(9) hoped to increase the relevance of didactic course material following a three year undergraduate clinical course (two days per week) in primary care medicine; however, the ability of the program to do so was not accurately measured by before and after attitudinal scales. In a three-year early clinical program in medicine(11), students were observed to experience increased motivation to learn the content of didactic course work. Forster(5) also noted the importance of pairing the community practice experience with the didactic course offerings. This was accomplished in the CPPE by matching patient care assignments to the scheduled quarterly professional course assignments.

Introductory practice experiences have also been advocated because the integration of theory and practice may not only motivated students to learn but also enhance learning(26). Pairing didactic learning and patient care experiences in a medical curriculum has been associated with higher scores on the clinical sciences portion of the National Board of Medical Examiners (NBME Part II) examination(8). The results of Board of Pharmacy Examination scores were not evaluated in our study, because the NABPLEX exam does not have a specific clinical section. Future studies evaluating whether early practice experiences promote integration of theory and practice and lead to long-term recall of knowledge and skills should use assessment methods that evaluate these abilities.

Although not statistically significant, trends in the Auburn Instrument’s scores suggested that more highly motivated students upon entry to pharmacy school were those who had a higher motivation to learn at the end of the study, supporting use of motivation to learn as a criterion for admission to pharmacy school. Further study is needed to assess whether students who are more motivated to learn do so irrespective of the curriculum design. Future studies should also assess whether those more motivated are self-directed learners and predestined to be lifelong learners. Introductory practice experiences have been advocated to help students develop lifelong learning abilities(26).

Though it has been suggested that concurrent didactic and practice experiences may decrease the typical disillusionment of students(29), abbreviated clinical experiences have
not been proven to improve attitudes towards professional practice (24). Although no improvement in professional socialization was demonstrated in the study group compared to the control group in this longitudinal study, others have found that pharmacy students actually develop negative professional attitudes during traditional pharmacy educational experiences (28). Such negative effects on professionalism were neither measured nor observed in either group during this study. However, larger study groups may be needed to identify small differences in attitudinal changes if they do indeed exist. Because “appropriate socialization is vital for the existence of any health professional” (30), further study of longitudinal experiences is warranted.

Bucher and Stelling have reported the importance of peer interactions during the professional socialization process (20). Since the CPPE did not incorporate opportunities for students to collaborate with peers in providing patient care and students had limited contact with their faculty advisors, our project may not have provided the proper environment for enhancing the socialization process. Several of the study students recommended including reflective sessions with their peers and advisors at the end of each quarter. In addition to promoting reflective thinking skills, such an intervention may enhance the socialization process by fostering peer interactions during the practice experience. Future longitudinal experiences should incorporate more of these opportunities for peer interactions (26).

Whether the Schack-Hepler Instrument and the professional socialization scale of the Auburn Instrument can reliably detect changes attitudes related to professionalism should be considered, because the baseline scores of the Schack-Hepler Instrument for both the study and control student groups were similar to those of practicing pharmacists (19, 27). In addition, the internal consistency of both the Schack-Hepler Instrument and the professional socialization scale of the Auburn Instrument was only fair. A study design using qualitative methods, such as that used by Bucher and Stelling, may elucidate changes in attitudes that are not easily measured using attitudinal scales (20).

Many authors have observed an improvement in communication skills during longitudinal clinical experiences, but most have not attempted to measure the changes in these skills. Medical students demonstrated an increased ability to empathize and communicate as well as an increased appreciation for the humanity of their patients after a one year elective in a live-in geriatric facility (4). The early introduction of a three year clinical program for medical students was observed to improve both communication and observational skills (11). Other three year longitudinal programs introduced early in the medical school curriculum have included as goals improvements in interview techniques, interpersonal relationships, and student attitudes toward patients and their diseases (9). Simply adding a role model practitioner to an established medical school didactic course in communication resulted in a statistically significant increase in listening and communication skills (31). Utilization of practicing community pharmacists as role models in the longitudinal CPPE was intended to encourage the development and utilization of communication skills, psychosocial skills, and a holistic approach to pharmacy care. Though a difference in communication skills was not demonstrated by study subjects’ grades in a required communications course, Pharmacist Preceptors frequently commented on the observed development of these skills through out the course. In future studies, other measures such as Objective Structured Clinical Examination results may be a better indicator of improved communication skills than a course grade.

The attitudinal scales of the patient families also did not indicate a change during the program. This is possibly due to the fact that the ratings were extremely high at baseline leaving little room for improvement. The scales, however, also did not reflect the development of a more negative attitude regarding pharmacists and pharmacy students during the program. The trend was, in fact, an improvement in rating the statements assessing the pharmacist’s and pharmacy student’s knowledge. Personal communications with the patient families revealed that most enjoyed the contact with the students and were indeed able to learn from them. Though not systematically evaluated, other programs which assign patients to students have also found them well accepted (32).

Not addressed was the effect of a program of this type on student attitudes after graduating from pharmacy school. The possibility that a program of this kind could affect postgraduate attitudes merits evaluation.

CONCLUSION

The instruments utilized in this study did not demonstrate a difference in the attitudes of students who participated in the CPPE and the control group regarding clinical practice in community, motivation to learn, and professionalism. However, these findings may be due to a lack of sufficient power and moderate internal consistency of the attitudinal instruments used in the study. A trial with a larger number of subjects may increase power and, therefore, detect a change in student attitudes. We recommend consideration of qualitative research methods rather than just quantitative in this area. No difference was demonstrated between the groups in the grade achieved in a required communications course; however, assessment methods such as simulations may more accurately measure changes in communication skills. Further study is needed to assess whether an integrated curricular model can motivate learners and inculcate them to become lifelong learners or whether motivation to learn should be an admissions criterion.

Though we were unable to demonstrate a significant difference in attitudes toward clinical practice in the community, motivation, or ability to communicate and socialize professionally, the program was felt to be beneficial by all students and precepting pharmacists that were informally interviewed. We feel that this type of goal-oriented, self-motivated, self-directed learning in an early practice experience is a valuable one and should be incorporated into professional curricula. In an earlier paper (17), we provided a detailed description of our program as well as a discussion of potential program modifications. Suggested possibilities for improvement in future courses of this type include shortening the program, retooling the modules, strengthening the faculty advisor’s role in the program, improving family selection, and possibly pairing students.

Acknowledgments. The assistance of Patricia S. O’Sullivan EdD during statistical analysis and input from both Daniel Albrant PharmD and C. Larry Thomasson PhD during the development and initiation phases of the project is greatly appreciated.
APPENDIX A. PATIENT FAMILY QUESTIONNAIRE

For each statement below, circle the best answer:

1. A pharmacist dispenses medicines. Disagree Uncertain Agree
2. A pharmacist makes sure I know how to take my medicines. Disagree Uncertain Agree
3. A pharmacist identifies problems that I am having with my medicines. Disagree Uncertain Agree
4. I feel comfortable talking to a pharmacist about my medicines. Disagree Uncertain Agree
5. I feel like I know a lot about my medicines. Disagree Uncertain Agree
6. A pharmacist knows as much about medicines as a doctor. Disagree Uncertain Agree
7. A pharmacist knows more about medicines than a doctor. Disagree Uncertain Agree
8. Pharmacy students don’t know much about medicines. Disagree Uncertain Agree
9. It is important for me to tell a pharmacist about medicines I am taking that don’t require a prescription. Disagree Uncertain Agree
10. It is important for me to tell my pharmacist of any problems I am having with my medicines. Disagree Uncertain Agree
11. A pharmacist are.

APPENDIX B. AUBURN INSTRUMENT

The items measuring each attribute were mixed in random order on the questionnaire administered to the students. Each item was ranked as strongly agree, agree, neutral, disagree, or strongly disagree (where strongly agree = 5 and strongly disagree = 1). The three motivation items had a reversed scale.

Items measuring professionalism.
1. I have a clear picture of the type of pharmacist I want to be (i.e., hospital pharmacist, community pharmacist). Disagree Agree Neutral
2. I am comfortable with making decisions on my own without input from another pharmacist or health professional. Disagree Agree Neutral
3. I have exercised my own judgment in decisions related to pharmacy in spite of pressures from a client or employer to do otherwise. Disagree Agree Neutral
4. As a pharmacist, I will be comfortable saying “I don’t know” when uncertain of an answer. Disagree Agree Neutral
5. I feel like I have experienced what the actual roles of a pharmacist are. Disagree Agree Neutral
6. I am a better practitioner because of knowledge I have gained on my own (i.e. not required for a course or continuing education program).

**Items measuring attitudes towards clinical pharmacy practice.**
1. A clinical practice is possible in the community pharmacy setting.
2. Patients are more likely to take their medications as prescribed by the physician if the community pharmacist provides patient counseling.
3. It is worthwhile to provide patient education.
4. Assessment of a patient’s response to therapy should be a standard of practice for pharmacists in the community setting.
5. A pharmacist is an essential component of the health care team.
6. It is valuable for a pharmacist to be a member of a professional organization.
7. Pharmacists can save lives.
8. As a pharmacist, it will be my responsibility and not just that of the physician to make sure the patient is receiving the best drug therapy.
9. I believe a pharmacist in the community setting has an important role in identifying problems patients are having with their drug therapy.
10. I believe a community pharmacist can identify drug problems of patients that are not detected by the patient’s physician.

**Items measuring motivation to learn.**
1. After graduation, I look forward to not having to study and learn.
2. The time I spend studying for pharmacy courses could be put to better use.
3. Pharmacy courses require time I could use more beneficially.