BRIEF

Using Student Pharmacists to Teach Medical Students Prescription Writing and Over the Counter Product Selection

Corresponding Author:
Sheila M Allen, Pharm D, BCPS
University of Illinois at Chicago College of Pharmacy
Department of Pharmacy Practice
Office Phone:(312)355-0371
E-mail: sallen7@uic.edu

Additional Authors:
Marlowe Djuric Kachlic, Pharm D
University of Illinois at Chicago College of Pharmacy
Department of Pharmacy Practice
Office Phone:(312)996-0882
E-mail: mdjuri1@uic.edu

Louise Parent-Stevens, Pharm D, BCPS
University of Illinois at Chicago College of Pharmacy
Department of Pharmacy Practice
Office Phone:(312)996-1536
E-mail: lstevens@uic.edu

ABSTRACT

Objective. Interprofessional education (IPE) is becoming increasingly important as the United States healthcare system moves towards more team-based patient care. Utilizing student pharmacists as educators of medical students has the potential to promote interprofessional relationships while providing an opportunity for student pharmacists to develop as healthcare team educators. The intent of these two studies was to measure the impact of pharmacy student provided education to medical students.

Methods. In a required workshop, fourth year pharmacy students (P4s) taught second year medical students (M2s) the basics of prescription writing. In a selective education session, P4s led a case-based discussion of over the counter drug use for third year medical students (M3s) on their family medicine rotation. The pharmacy students were surveyed before and after the prescription writing workshop and the medical students were surveyed prior to and after the completion of the workshop or selective.
Results. At the end of the workshop, surveys showed that M2s were more confident in their abilities to write prescriptions and P4s were more confident in their ability to teach about prescription writing. Based on the pre and post-survey results, M2s and P4s were confident in the learning environment throughout the activity. After participating in the over the counter selective, medical students were more confident about accessing resources on over the counter drugs and in making recommendations and counseling patients about over the counter drug use.

Conclusion. Pharmacy students can be effective interprofessional educators for medical students on key aspects of the medical curriculum.

Keywords: interprofessional, IPE, students, teachers, medical

INTRODUCTION:

Interprofessional education (IPE) is becoming increasingly important as the US healthcare system moves towards more team-based patient care. As such, the 2003 Institute of Medicine’s report entitled Health Professions Education: A Bridge to Quality spoke about a “new vision” for health professions education, recommending work in interdisciplinary teams as a core competency for health professions education.¹ In 2013, the Accreditation Council for Pharmacy Education (ACPE) standards required the incorporation of IPE into college of pharmacy curricula.² Similarly in 2014, the Liaison Committee for Medical Education (LCME) implemented a new medical school accreditation standard addressing the role of IPE in support of team based care.³ These requirements for IPE within curricula have transcended across health education disciplines as outcomes suggest that IPE may positively impact patient care outcomes.⁴

It is well documented that health professional students enjoy participation in IPE activities and gain a better understanding of professional roles through their participation in IPE activities.⁵ ⁶ However, published literature related to IPE activities involving pharmacy students to date has typically centered on models where the faculty or clinician from a given health discipline is serving as the teacher within the
interprofessional activity or an interprofessional team of health care students are serving as teachers to the
lay public. Thus, the specific model of pharmacy student as the primary teacher within IPE activities has
not been documented.

Our college of pharmacy faculty have engaged with faculty in our college of medicine in two
distinct initiatives where pharmacy students serve as the primary teacher within an IPE activity:

- Prescription writing and over the counter (OTC) product selection. We hypothesized that using pharmacy
  students as teachers within these IPE initiatives would be an effective teaching endeavor and improve
  student confidence in abilities for both the teacher and the learner. Additionally, we hypothesized this
  teaching model would also improve the receptiveness to learning from (medical students) and teaching to
  (pharmacy students) other health disciplines for the students involved in these initiatives.

METHODS

Two educational endeavors were evaluated, and students involved were surveyed. Study
protocols for both were approved by the University of Illinois at Chicago (UIC) Institutional Review
Board.

For the first activity, second-year medical students (M2s) participated in a prescription writing
workshop taught by fourth-year student pharmacists (P4s) which is a component of the required
Essentials of Clinical Medicine course. P4s who had experience working in a community pharmacy or
had completed their community Advanced Pharmacy Practice Experience (APPE) rotation to date were
recruited through an email sent to the class listserv one month prior to the session. Students who
volunteered were given the facilitator materials (the exercises with answers as well as the plenary session
slides) the week prior to the workshop to review. The hour prior to the workshop was spent reviewing the
activities with all faculty and P4s involved, including answering questions and providing tips on
delivering the information. The 3.5-hour workshop began with a College of Pharmacy faculty member
providing a one-hour plenary session on the critical points of prescription writing to 200 M2 students.
Materials presented in the plenary session as well as the exercises the M2s completed during the
workshop were developed by a group of P4s on Academic APPE rotation with one of the faculty members coordinating the workshop. Then, M2s were broken up into their usual 12-15 person work groups, and the workshop continued in 12-15 rooms each led by two P4s. The P4s led the M2s through several exercises illustrating the finer points of prescription writing, such as writing sigs with complicated directions, finding errors in completed prescriptions, writing prescriptions for devices and supplies, and counseling a patient on a new medication. At the end of the semester, all of the M2s completed an Objective Structured Clinical Examination (OSCE), and one of the exercises included writing four prescriptions based on different scenarios and complexities that were covered in the workshop.

One week prior to the workshop, a Qualtrics® survey was sent out to all 200 medical students regarding their confidence in writing different types of prescriptions, the perceived effectiveness of the pharmacy students’ teaching, and their perception of the role of the pharmacist in the healthcare team. At the conclusion of the workshop, another survey was sent out asking the same questions as the pre-workshop survey. In addition, the post-workshop survey asked the M2s to rate the helpfulness of the workshop, as well as provide any comments. The post-workshop survey was open for one week after the workshop.

The day prior to the workshop, the 22 participating P4s were surveyed on their confidence in facilitating the small group session on prescription writing, and their perceived perception of how receptive the medical students would be to their teaching. The pre-workshop survey sent to P4s also collected information on work history as well as prior experience facilitating a workshop, recitation or lab. After the workshop, the P4s were asked to complete a post-workshop survey which asked the same confidence in the material, perceived receptiveness of the medical students to their teaching, in addition to providing any comments about the workshop. This survey was also open for one week after the workshop.

The second activity occurred during the required Family Medicine rotation, in the third year of the medical school curriculum. A subset of medical students (M3s) on this rotation chose to participate in a two session selective on OTCs. Prior to the first session, all M3s enrolled in the workshop received a
slide set created by pharmacist faculty/students discussing common OTC medications for pain/fever, cough, cold/allergies, gastrointestinal disorders and selected vitamins and minerals. The first two hour session involved a case-based discussion of these topics led by a group of fourth-year student pharmacists (P4s). For the second two hour session, each participating M3 developed, answered and presented a self-identified, case-based clinical question from their rotation related to the use of OTC medications, including vitamins, minerals and herbal medications.

The participating P4 students were on academic or ambulatory care rotation with one of the two pharmacist faculty who developed the selective. One to two weeks prior to the first session, these students updated the pre-workshop slide set and developed cases for use in the first selective session. These were then reviewed by the pharmacist faculty who provided feedback and guidance to the students. Discussion during the second session was facilitated by the participating fourth-year student pharmacists.

Prior to the first session of the selective, a Qualtrics® survey was sent to all M3s on Family Medicine clerkship (~25 students every six weeks) with items regarding their knowledge and confidence on recommending and counseling on OTC and herbal products. M3 students who participated in the OTC Drugs Selective were surveyed after the 2nd session asking the same questions about confidence on recommending and counseling on OTC and herbal products.

Pre- and post-survey results from both activities were compared using an independent two-tailed t-test to determine significance, defined as $p<.05$.

**RESULTS**

Prior to the prescription writing workshop, a survey was completed by 20 of the 22 P4 volunteers, and the post-workshop survey was completed by all 22 of the P4s. Baseline work experience and small group facilitation experience of the P4s are depicted in Table 1. P4s’ confidence regarding their ability to teach the M2s the material presented in the workshop as well as the perceived receptivity of the M2s to their teaching is depicted in Table 2.
The pre-workshop survey was completed by 143 of the 200 M2s, and the post-workshop survey was completed by 103 of the 200 M2s. M2s’ confidence in the material presented during the workshop as well as their confidence in P4s being able to teach them prescription writing is depicted in Table 3. The M2s see pharmacists as having an important or very important role in the healthcare team both before and after the workshop (93% and 98%). After the workshop, 93 of the 103 M2s (90%) felt that the workshop was “helpful” or “extremely helpful” for them moving forward in their clinical experiences.

All M2s passed the prescription writing portion of the OSCE at the end of the semester. The College of Pharmacy faculty that coordinated the workshop also graded the prescription writing OSCE, and were able to create a list of common errors (appropriate use of National Provider Identifier (NPI) and Drug Enforcement Administration (DEA) numbers; when to use “may not substitute;” including all parts of a sig) that were given to the M2s at the next IPE workshop. These common errors will also be incorporated into exercises created for workshops in future years.

Prior to the OTC Drugs Selective, 68 M3s responded to the pre-selective survey; of those 36 (54%) participated in the selective. Twenty-five M3s answered the post-selective survey, all of whom participated in the selective. After participation in the selective, M3s were significantly more likely to indicate familiarity with online resources for looking up non-prescription medications, feel more confident making recommendations for patients on non-prescription medications and feel more confident counseling patients on their use of non-prescription medications (see Table 4). The M3s who participated in the selective were not significantly more likely to ask patients about their use of non-prescription medications than non-participants.

DISCUSSION

Overall, both teaching initiatives were successfully led by P4s. Specific to the M2 Prescription Writing Workshop, M2s were more confident in their prescription writing abilities after participating in the P4 led workshop. Additionally, P4s were more confident in the material they presented after teaching the workshop. Both M2s and P4s demonstrated a receptiveness to an interprofessional learning
environment. Within the M3 OTC Drugs Selective, M3s showed an improvement in confidence in their knowledge and comfort with recommending OTC medications, as well as their ability to access resources to find information on OTC medications. Within both of these teaching initiatives, the teacher (P4) and learner (both M2s and M3s) improved in their confidence with their abilities related to the material presented: prescription writing and OTC product selection.

There are some limitations to consider in the interpretation of these outcomes. First, since our College of Pharmacy and College of Medicine are part of a health campus, the perception of pharmacists as part of the health care team might be more favorable than on a campus that does not have several health science programs located close together. Second, since the surveys were given immediately after the activities were done, we do not know how the interactions affect pharmacists’ and physicians’ long term perceptions of interprofessional relationships. A future survey could be done to see if these interprofessional attitudes transcend into practice. While we used P4 students with community work experience for the prescription writing workshop, the students who participated had varying amounts of experience, though all had experience beyond just IPPE rotations. Also, the plenary session was taught by a college of pharmacy faculty member and not a student. In future iterations of this workshop, students on academic rotations could deliver the introductory session. A limitation of the OTC Drugs Selective is that we surveyed all M3s on Family Medicine Clerkship prior to the class, but then only surveyed the students who participated in the selective after the class. Since students who chose to do the selective might have some bias with the topic (either higher confidence or lower confidence) to begin with, we should provide the second survey to all students again to compare their responses. Additionally, comparing the two groups’ responses before and after the selective might not illustrate the difference since the sizes of the groups were different. Finally, not all pharmacy or medical students participated in these activities.

The role of a P4 student as teacher is not unique. Many colleges of pharmacy utilize senior students in the training of junior students in both the classroom and experiential environments with favorable outcomes. Utilizing P4 students as teachers within IPE activities is a natural progression in the development as healthcare professionals. Our studies have shown that P4s serving as teachers within IPE
activities has a favorable impact on students’ confidence in abilities and their perception of their role within the healthcare team.

These successful IPE initiatives have opened up opportunities for our pharmacy students to teach our medical students in other areas, including teaching immunizations, inhalers, diabetes injectables, and glucose testing. Additionally, we are also exploring our P4s teaching dental students how to write prescriptions and provide immunizations. We hope that with the expansion of these IPE initiatives, it will provide an opportunity for more of our P4 students to participate and benefit professionally from these experiences.

CONCLUSIONS

Using fourth year pharmacy students as teachers was effective in teaching medical students various practice related skills in their M2 and M3 year, while improving confidence in abilities of both the medical and pharmacy students. It also demonstrated a receptiveness among students involved in these initiatives to participate in an interprofessional learning environment.

REFERENCES


Table 1. Pharmacy Student Community Pharmacy Work History and Teaching Experience

<table>
<thead>
<tr>
<th></th>
<th>P4 Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worked as technician in community pharmacy</td>
<td>85%</td>
</tr>
<tr>
<td>Technician for ≥ 3 years</td>
<td>70%</td>
</tr>
<tr>
<td>Facilitated a small group interactive session</td>
<td>75%</td>
</tr>
<tr>
<td>Facilitated ≥ 5 times</td>
<td>40%</td>
</tr>
</tbody>
</table>

P4=fourth year student pharmacist
Table 2. Pharmacy Student Survey Results on Confidence with and in Teaching Prescription Writing

<table>
<thead>
<tr>
<th>P4 confidence in ability to teach M2s how to:</th>
<th>P4 Respondents Pre-workshop N=20</th>
<th>P4 Respondents Post-workshop N=22</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write a prescription that contains all legally required elements</td>
<td>85%</td>
<td>100%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Write a prescription that is free of medical abbreviation errors</td>
<td>95%</td>
<td>100%</td>
<td>.001</td>
</tr>
<tr>
<td>Write a prescription for a medical device</td>
<td>65%</td>
<td>100%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Write a prescription that can be filled by a pharmacist without further clarification</td>
<td>75%</td>
<td>100%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Consult a reputable drug information resource to clarify prescription details</td>
<td>100%</td>
<td>100%</td>
<td>.01</td>
</tr>
<tr>
<td>Know what to counsel a patient on in regards to a new prescription</td>
<td>85%</td>
<td>100%</td>
<td>.002</td>
</tr>
<tr>
<td>Write a prescription for a medication that has detailed administration instructions</td>
<td>95%</td>
<td>100%</td>
<td>.03</td>
</tr>
<tr>
<td>Receptiveness of medical students learning prescription writing from a pharmacy student b</td>
<td>70%</td>
<td>100%</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

a Scale for this question was: Not confident at all, Somewhat confident, Confident, Extremely Confident-% for this item includes those students who responded Confident or Extremely Confident

b Scale for this question was: Not receptive at all, Somewhat receptive, Receptive, Extremely Receptive-% for this item includes those students who responded Receptive or Extremely Receptive

P4=fourth year student pharmacist; M2=second year medical student
Table 3. Medical Student Survey Results on Confidence in Prescription Writing and Pharmacy Students as Teachers of Prescription Writing

<table>
<thead>
<tr>
<th>M2 confidence in ability to:</th>
<th>M2 Respondents Pre-workshop N=143</th>
<th>M2 Respondents Post-workshop N=103</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write a prescription that contains all legally required elements</td>
<td>6%</td>
<td>64%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Write a prescription that is free of medical abbreviation errors</td>
<td>13%</td>
<td>63%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Write a prescription for a medical device</td>
<td>3%</td>
<td>43%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Write a prescription that can be filled by a pharmacist without further clarification</td>
<td>8%</td>
<td>63%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Consult a reputable drug information resource to clarify prescription details</td>
<td>19%</td>
<td>71%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Know what to counsel a patient on in regards to a new prescription</td>
<td>15%</td>
<td>64%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Write a prescription for a medication that has detailed administration instructions</td>
<td>7%</td>
<td>54%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Confidence in a P4 student teaching prescription writing a</td>
<td>88%</td>
<td>93%</td>
<td>.08</td>
</tr>
</tbody>
</table>

* Scale for this question was: Not confident at all, Somewhat confident, Confident, Extremely Confident. % for this item includes those students who responded Confident or Extremely Confident.

P4=fourth year student pharmacist; M2=second year medical student.
Table 4: Medical Student Attitudes Towards Over the Counter Medications

<table>
<thead>
<tr>
<th></th>
<th>M3 Respondents Pre-Survey (N=68)</th>
<th>M3 Respondents Post-Survey (N=25)</th>
<th>p-value</th>
</tr>
</thead>
</table>
| When interviewing patients, I ask about their use of OTC medications.  
I am familiar with online resources for looking up OTC medications. | 68 | 76 | .20 |
| When clinically appropriate, I feel confident making recommendations for patients of OTC medications. | 47 | 96 | <.001 |
| I feel confident counselling a patient on the use of OTC medications. | 52 | 96 | <.001 |

\[a\] Scale for this question was: Never, Rarely, Sometimes, Often, Always-\% for this item includes those students who responded Often or Always

\[b\] Scale for this question was: Strongly disagree, Disagree, Neither Agree nor Disagree, Agree, Strongly agree-\% for this item includes those students who responded Agree or Strongly Agree

P4=fourth year student pharmacist; M2=second year medical student