The Impact of an Interprofessional Practice Experience on Readiness for Interprofessional Learning

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BACKGROUND AND OBJECTIVES: Professional silos still exist in practice and education. At our institution, all medical students are exposed to an interprofessional (IP) practice experience during their family medicine clerkship. This study examines the impact of this IP practice experience on students’ attitudes toward IP learning. In addition, this study examines the further impact on attitudes of a subset of students who were exposed to the IP practice experience integrated within an intentional IPE curriculum built to support and enhance experiential learning.

METHODS: All students rotating through the IP practice experience were invited to participate. Only those who completed the Readiness for Interprofessional Learning Scale (RIPLS), both pre-post were included in the analysis. Comparisons were made by school and by exposure to the integrated experiential model.

RESULTS: Out of 422, a total of 252 (59.7%) students completed both RIPLS pre-post. Analysis revealed statistically significant pre-post differences for all students for Teamwork and Patient-Centeredness. Medicine responses were less favorable for Teamwork and Professional Identity than nursing and pharmacy. For a subset of students exposed to the integrated experiential model, responses were more favorable for Teamwork, Professional Identity, and Patient-Centeredness compared to students without this exposure.

CONCLUSIONS: Attitudes toward Teamwork and Patient-Centeredness were more favorable for all respondents after exposure to the IP practice experience. Differences by school might be due to professional culture. Students exposed to the integrated experiential model had more favorable responses across all subscales than those not exposed. For the integrated experiential model to be deemed valuable, assessment of behavior change is warranted.

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Successful interprofessional education (IPE) curricular interventions have historically been positioned in the classroom and not in the clinics or wards. In addition, assessment of these IPE interventions has focused on learner satisfaction and shifts in attitudes. In 2011, the Interprofessional Education Collaborative (IPEC) published core competencies to guide development and assessment of IPE models. Importance was placed on the development of IPE curricular interventions more proximate to the practice environment, allowing students from two or more professions to “learn about, from and with each other” while impacting patient outcomes.

To answer this call, interprofessional (IP) practice experiences are being developed as IPE curricular interventions. Little is known about the impact of these IP practice experiences on shifts in attitudes of learners. While a gulf still exists between practice environments and medical education, family medicine is well positioned to champion the practice transformation initiatives that also facilitate the shift of IPE beyond the classroom and into practice environments.

A recent Council of Academic Family Medicine Educational Research Alliance (CERA) study offers hopeful evidence that simultaneous transformation of education and practice can occur. In the third of family medicine clerkships offering any aspect of IPE, IPE was offered more frequently in clinical training than in didactics. The primary objective of this study is to examine the impact of an IP practice experience on attitudes toward IP learning. A secondary objective of this study is to examine the impact of the IP practice experience when integrated within an intentional IPE
curriculum built to support and enhance experiential learning. The attitudes of a subset of students exposed to the integrated experiential model are compared to the attitudes of students who were exposed to the IP practice experience alone.

**Local Context**
In 2011, the Department of Family Medicine at the University of Kansas Medical Center designed an IP practice experience in partnership with the KU Schools of Nursing and Pharmacy. The IP practice experience provides students access to direct patient care as synchronous IP teams under the supervision of faculty preceptors (see Table 1). Students participate in the IP practice experience each week. The number of clinic days is variable between professions (eg, third-year medical students participate at least one half day a week as part of their family medicine clerkship). For the students who were exposed to the IP practice experience alone.

**Methods**
Between the years of 2012–2014, all third-year medical students rotating through their family medicine clerkship at the University of Kansas Medical Center were exposed to the IP practice experience. Four medical students per rotation were randomly assigned to experience the integrated experiential model. All other health professions students were exposed to the integrated experiential model as part of their profession specific clinical experiences. Length in rotation and calendar mismatch also account for differences in exposure. Students from all professions were invited to participate in the study. Our Institutional Review Board approved the study.

The Readiness for Interprofessional Learning Scale (RIPLS) was used to evaluate students’ attitudes toward IP learning and teamwork. The RIPLS is a validated 23-item self-report measure of attitudes toward IP learning utilizing a 5-point Likert scale (1=strongly disagree, 5=strongly agree) and containing three subscales: Teamwork/Collaboration, Professional Identity, and Patient Centeredness. The mean subscale score was used for all analyses. Higher scores indicate more favorable attitudes except for the Professional Identity subscale where lower scores are more favorable. The RIPLS was administered prior to and at the end of the IP practice experience.

Students who completed both the pre-post RIPLS were included in the analyses. To examine the impact of the IP practice experience on attitudes toward IP learning, pre-post RIPLS scores were compared for all respondents and by school. School comparisons were accomplished using 2 (pre/post) x 3 (school) analyses of variance with repeated measures; only scores from medicine, nursing, and pharmacy were used. To examine the impact of the integrated experiential model on attitudes toward IP learning, comparisons by exposure to the integrated experiential model were done using 2 (time) x 2 (pre/post) x 3 (school) analyses of variance with repeated measures. Dependent sample t tests and Tukey Honestly Significant Difference (HSD) significant difference tests were used for follow-up analyses as appropriate. Significance level was set at 0.05 with all analyses conducted using SPSS version 22.

**Table 1: The Interprofessional Practice Experience**

<table>
<thead>
<tr>
<th>Student Professions</th>
<th>Faculty Preceptors</th>
<th>Weekly Clinic Schedule</th>
<th>Weekly Patient Census</th>
<th>Patient Population</th>
<th>Patient Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third-year medicine, second-year nursing, fourth-year pharmacy</td>
<td>MD, DNP, PharmD, OTD, PT PhD, MHSA, RHIA, clinical psychology PhD, JD</td>
<td>Six half days a week of the IP experience</td>
<td>Eight patients scheduled per MD provider</td>
<td>Registry: 1,039 patients</td>
<td>Patient satisfaction at baseline and every 6 months</td>
</tr>
<tr>
<td>Other professions: OT, PT, health information management, clinical psychology, medical-legal partnership</td>
<td>Preceptors guide tx plan, assess student teams, and co-precept</td>
<td>One half day a week for the IPE curriculum for those exposed to the integrated experiential model</td>
<td>Two MD providers scheduled per half day</td>
<td>Urban poor, high utilizers, chronic disease</td>
<td>A1C, BP, and PHQ 2/9 at baseline and every 6 months*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>96 patients per week</td>
<td></td>
<td>Top diagnoses: hypertension, type 2 diabetes mellitus, depression</td>
<td></td>
</tr>
</tbody>
</table>

* Patient outcomes are currently being tracked for the population served by the Interprofessional (IP) teams of students rotating through this IP practice experience. This data will be reported in a future study.
Results

A total of 422 students participated in the IP practice experience over 2 years. A total of 252 students completed both the pre-post RIPLS for a response rate of 59.7%. Proportional analyses revealed no statistically significant differences in response rate between the schools. Of the 422 students, 162 students were exposed to the integrated experiential model, of which 99 students (61.1%) completed the pre-post RIPLS (see Table 3).

Dependent sample t tests indicated statistically significant differences between pretest and posttest means for all respondents for the RIPLS subscales, Teamwork (t[251]=3.71, P=.0005) and Patient Centeredness (t[251]=2.48, P=.01) (see Table 4).

Comparisons by School

Separate 2 (pre/post) X 2 (exposure) repeated measures analyses of variance were used for each RIPLS subscale (see Table 4). For the Teamwork and Patient Centeredness subscales, post-scores were higher than pre-scores; medicine Teamwork scores, however, were lower than both nursing and pharmacy Teamwork scores. On the Professional Identity subscale, medicine ratings were higher (less favorable) than both nursing and pharmacy ratings. No significant interactions emerged.

Comparisons by Exposure to Integrated Model

Separate 2 (pre/post) X 2 (exposure) repeated measures analyses of variance were used for each RIPLS subscale (see Table 5). Students exposed to the integrated experiential model had higher Teamwork scores and lower (more favorable) Professional Identity scores than those not exposed. In addition, a significant interaction between pre/post and exposure to the integrated experiential model emerged on the Patient Centeredness subscale. This interaction revealed that students exposed to the integrated experiential model rated Patient Centeredness higher.

Table 2: The Curriculum for the Integrated Experiential Model

<table>
<thead>
<tr>
<th>Curricular Activity</th>
<th>Main Topics</th>
<th>IPEC Core Competency Domains</th>
</tr>
</thead>
</table>
| Crucial Conversations and Conflict Resolution Interprofessional (IP) Simulation | - Conflict resolution on teams  
- Crucial conversations on teams  
- Silence on teams  
- Disruptive behaviors on teams | IP Communication  
Values and Ethics                                         |
| IP Medical Error Disclosure Simulation                  | - Medical error disclosure  
- Root cause analysis  
- IP teams and patient safety                                             | Values and Ethics  
Roles and Responsibilities  
IP Communication                           |
| IP Agents of Change                                      | - Barriers and solutions to IP collaboration  
- Models of team-based care  
- Health care systems change (micro-, meso-, macro-levels)            | Roles and Responsibilities  
Team and Teamwork                                              |
| IP Team Assessments                                      | 360-degree evaluation:  
- Overall team evaluation  
- Self-evaluation  
- Individual evaluation by all team members                        | Roles and Responsibilities  
IP Communication  
Team and Teamwork                                           |
| Pandora's Box: IP Social Determinants of Health Simulation | - Social determinants of health  
- IP team-based care of patient populations                         | Roles and Responsibilities  
Team and Teamwork  
Values and Ethics                                         |
| IP Journal Club                                           | Journal articles with themes related to:  
- Professional culture  
- Professional hierarchies and power dynamics  
- Team skills  
- Health care reform and team-based care                       | Values and Ethics  
Roles and Responsibilities  
IP Communication  
Team and Teamwork                                           |
| IP Quality Improvement and the Patient-Centered Medical Home | - Quality improvement in primary care  
- Patient-centered medical homes                                    | Team and Teamwork                                               |
| IP Teaching OSCE (iTOSCE)                                | - IP communication and teamwork  
- Collaborative care                                                  | Roles and Responsibilities  
IP Communication  
Team and Teamwork                                           |
| IP Home Visits                                           | - IP practice  
- Social determinants of health  
- Hot-spotting                                                       | Roles and Responsibilities  
Teams and Teamwork  
Values and Ethics                                         |
Table 3: Summary of Students by Profession and Exposure

<table>
<thead>
<tr>
<th>Profession</th>
<th>Total Exposed to the Interprofessional Practice Experience n=422 (% total)</th>
<th>Total Respondents Who Completed the Pre/Post RIPLS n=252</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not Exposed to Integrated Model n=153 (% total)</td>
</tr>
<tr>
<td>Medicine</td>
<td>244 (58%)</td>
<td>137 (90%)</td>
</tr>
<tr>
<td>Nursing</td>
<td>43 (10%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>82 (19%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Health Information Management (HIM)</td>
<td>20 (5%)</td>
<td>7 (5%)</td>
</tr>
<tr>
<td>Law</td>
<td>12 (3%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Occupational Therapy (OT)</td>
<td>12 (3%)</td>
<td>3 (2%)</td>
</tr>
<tr>
<td>Physical Therapy (PT)</td>
<td>9 (2%)</td>
<td>6 (3%)</td>
</tr>
</tbody>
</table>

* Not all students exposed to the IP practice experience participated in the integrated experiential model. Four medical students per clerkship rotation are assigned to the integrated experiential model. All other students participate as part of their profession specific clinical experience. Length in rotation and calendar mismatch account for the differences in exposure by profession.

Table 4: Summary of Pre and Post RIPLS Scores

<table>
<thead>
<tr>
<th>Scale</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>All respondents¹²³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork/Collaboration*</td>
<td>252</td>
<td>4.38</td>
</tr>
<tr>
<td>Professional Identity</td>
<td>252</td>
<td>2.45</td>
</tr>
<tr>
<td>Patient Centeredness*</td>
<td>252</td>
<td>4.65</td>
</tr>
<tr>
<td>Medicine students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork/Collaboration*</td>
<td>153</td>
<td>4.27</td>
</tr>
<tr>
<td>Professional Identity</td>
<td>153</td>
<td>2.58</td>
</tr>
<tr>
<td>Patient Centeredness</td>
<td>153</td>
<td>4.64</td>
</tr>
<tr>
<td>Nursing students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork/Collaboration</td>
<td>23</td>
<td>4.53</td>
</tr>
<tr>
<td>Professional Identity</td>
<td>23</td>
<td>2.10</td>
</tr>
<tr>
<td>Patient Centeredness</td>
<td>23</td>
<td>4.60</td>
</tr>
<tr>
<td>Pharmacy students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamwork/Collaboration*</td>
<td>46</td>
<td>4.56</td>
</tr>
<tr>
<td>Professional Identity</td>
<td>46</td>
<td>2.21</td>
</tr>
<tr>
<td>Patient Centeredness*</td>
<td>46</td>
<td>4.74</td>
</tr>
</tbody>
</table>

* Dependent t tests comparisons of pretest and posttest means statistically significant at P<.05.
¹Teamwork: A 2 (pre/post) x 3 (school) repeated measures ANOVA demonstrated a significant main effect for the pre-post ratings (F[1,219]=16.21, P=.0005) with the post-teamwork scores being higher than the pre scores. There was also a main effect for school (F[2,219]=3.46, P=.0005). Post-hoc Tukey HSD tests revealed that medicine ratings were lower than both nursing and pharmacy ratings.
²Professional Identity: A 2 (pre/post) x 3 (school) repeated measures ANOVA revealed a main effect for school (F[2,219]=7.99, P=.0005). Post-hoc Tukey HSD tests suggested that medicine ratings were higher than both nursing and pharmacy ratings.
³Patient Centeredness: A 2 (pre/post) x 3 (school) repeated measures ANOVA demonstrated a significant main effect for the pre-post ratings (F[1,219]=10.57, P=.001) with the post-patient centered ratings higher than the pre scores. No other significant differences emerged.
Discussion
After exposure to the IP practice experience, pre-post attitudes for all respondents were statistically different for Teamwork and Patient-Centeredness. Although this finding contributes to the current literature on the impact of IP practice experiences on attitudes of learners, student scores were already positive at baseline, making it difficult to assign value to the IP practice experience without overestimating its impact. Medicine responses were less favorable for Teamwork and Professional Identity than both nursing and pharmacy. Differences in attitudes toward Teamwork and Professional Identity by school might be due to professional culture. Physicians are trained to assume leadership. The experience of sharing leadership during an IP practice experience flattens hierarchy and blurs professional boundaries through role overlap. Less favorable responses by medical students toward Professional Identity support this conclusion. In our study, medical students were more likely to strongly agree with statements that diminished the value of other professions while exaggerating the value of medicine’s role on the team. This could be considered an area for future research.

In the integrated experiential model, we directly address professional culture and hierarchy by integrating an IPE curriculum mapped to the IPEC core competencies. The more favorable Teamwork, Professional Identity, and Patient Centeredness scores suggest that the integrated experiential model might be preferable to the IP practice experience alone.

There are limitations to this study worth noting. The response rate, while adequate, limits the generalizability of the study. In addition, the variability of exposure to the IP practice experience and integrated experiential model may limit the generalizability of the results. For example, it is difficult to determine the appropriate dose of IPE for students in the clinical environment. Also, IP learners often come to an IP experience, pre-post attitudes for all respondents were statistically different for Teamwork and Patient-Centeredness. Although this finding contributes to the current literature on the impact of IP practice experiences on attitudes of learners, student scores were already positive at baseline, making it difficult to assign value to the IP practice experience without overestimating its impact. Medicine responses were less favorable for Teamwork and Professional Identity than both nursing and pharmacy. Differences in attitudes toward Teamwork and Professional Identity by school might be due to professional culture. Physicians are trained to assume leadership. The experience of sharing leadership during an IP practice experience flattens hierarchy and blurs professional boundaries through role overlap. Less favorable responses by medical students toward Professional Identity support this conclusion. In our study, medical students were more likely to strongly agree with statements that diminished the value of other professions while exaggerating the value of medicine’s role on the team. This could be considered an area for future research.

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References