Exploring Student-Led Interprofessional Education through a Community Service Project

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Abstract

PURPOSE The purpose of this research was to explore the effectiveness of a student-led interprofessional education (IPE) workshop in improving student attitudes and perceptions toward IPE. Students from four health science programs—Dental Hygiene, Communication Sciences and Disorders/Speech and Hearing, Health Services Administration, and Occupational Therapy—participated in a community service event. Students provided screenings to veteran patients, including a health history intake, hearing test, and sleep screening, while other students observed.

METHODS Students were asked to attend an orientation, a Vets Day IPE workshop, and a debrief session. This mixed-methods approach study utilized the Readiness for Interprofessional Learning Scale (RIPLS) to assess students' attitudes and perceptions toward IPE. The RIPLS (Likert scale) was used as a pre- and posttest to assess changes in students' scores. The pretest was administered prior to the IPE workshop, and the posttest was administered following the workshop. Qualitative data was derived from a debrief session where students answered guided questions regarding their experience through group discussion.

RESULTS Results indicated a statistically significant difference ($p<.05$) in participants' attitudes and perceptions toward IPE using the RIPLS. Statistical significance was found within each RIPLS subscale, where participants showed a positive change in their readiness for interprofessional learning. Qualitative data revealed positive feedback about the workshop and enhanced knowledge about different professions.

CONCLUSION The results of this study show that a student-led approach to IPE through a community service project is beneficial in improving student attitudes and perceptions of IPE.

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Implications for Interprofessional Practice

- Develop and implement interprofessional (IPE) experiences across health disciplines.
- Provide students with opportunities for interprofessional collaboration as practicing healthcare professionals, networking experiences, lifelong learning, and an understanding of the importance of the collaborative approach to healthcare.
- Provide beneficial IPE experiences for students in preparation for interprofessional practice through a student-led approach.
- Provide techniques for future IPE education by preparing students for more integrated teams in practice and opportunities across disciplines.

Introduction

The World Health Organization (WHO) states, "Interprofessional education occurs when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" (WHO 2010, p. 7). Collaborative practice improves health outcomes by strengthening health systems, thus making IPE an important step in creating an effective health workforce (WHO, 2010). In the rapidly changing landscape of healthcare, it is essential that tomorrow's health professionals be prepared to communicate, collaborate, and use evidence-based practice in an interprofessional manner, with the goal of improving patient outcomes (Institute of Medicine [IOM], 2001).

Changes in education and healthcare are increasing the demand for IPE to improve treatment outcomes. Healthcare is continuing to progress toward collaborative models where health professionals work together with patients, caregivers, and communities to deliver quality care. Moving healthcare workers through a system that provides IPE has been shown to help them gain skills needed to become part of a collaborative, practice-ready healthcare team (WHO, 2010). Provisions to the Affordable Care Act (ACA) include team-based care with an emphasis on the importance of affordable care, implementation of care teams, comprehensive care coordination, and population health management (Contreras, Stewart, Stewart, & Valachovic, 2018). Shared learning shapes the formation of interprofessional rather than uniprofessional collaboration and leads to valued contributions in the delivery of patient-centered care (Zraick, Harten, & Hagstrom, 2014). IPE has the potential to create common learning opportunities for healthcare professionals in various fields, therefore resolving misperceptions, miscommunication, and perceived hierarchy (Olenick, Allen, & Smego, 2010). Elimination of these issues may address the current separation between healthcare professionals and the resulting problems with healthcare delivery (Olenick et al., 2010).

IPE activities led by students rather than instructors may prove beneficial to the development of better attitudes, collaboration, and overall patient care. This study utilized the student-led approach, as there is a paucity of literature on this approach to IPE activities with dental hygiene students and other professions. Positive results and responses to the student-led IPE method are discussed in this study. As members of an interprofessional team, health professionals' education should be founded on a commitment to patient-centered care, based on the principles of evidence-based practice, and enhanced through the implementation of informatics and quality improvement (Institute of Medicine [IOM], 2001). IPE promotes lifelong learning and creates synergy while expanding access to care. This research study examined the attitudes and perceptions of students toward IPE when utilizing the student-led approach.

Literature Review

WHO recognizes that collaborative practice strength-

ens health systems. The combination of IPE and collaborative practice in healthcare settings will improve health outcomes (WHO, 2010). Research concludes that IPE is more effective when (1) principles of adult learning are involved (e.g., problem-based learning), (2) learning methods reflect real-world practice experiences (e.g., simulation-based learning), and (3) instructional activities promote interactions between students (Zraick, Harten, & Hagstrom, 2014). Many authors recommend that IPE be introduced early in curriculum for undergraduate students to help reduce negative attitudes associated with other professions and IPE.

The Interprofessional Education Collaborative (IPEC) promotes, encourages, and supports programs in preparing students to be future healthcare professionals ready for effective interprofessional collaboration, and to aid in better population health (Interprofessional Education Collaborative [IPEC], 2011). The success of IPE requires program-specific educational efforts to encourage interactive learning among health science programs. One of the main purposes of IPEC is to broaden interprofessional competencies to better achieve the Triple Aim, a framework developed by the Institute for Healthcare Improvement (IHI) to enhance healthcare delivery and outcomes. The approach incorporates three dimensions simultaneously to improve the patient experience of care, improve the health of populations, and reduce the per capita cost of healthcare (IHI, 2017). IPEC has recognized that in order to achieve the vision of the Triple Aim, continuous development of interprofessional competency by health professions students is needed. Research suggests that widespread burnout and dissatisfaction of health professionals is associated with reduced health outcomes and lower patient satisfaction (Bodenheimer & Sinsky, 2014). Recent research recommends using the Quadruple Aim framework, where a fourth aim has been added: attaining joy and satisfaction in work (Bodenheimer & Sinsky, 2014). The IHI (2017) recognizes an increase in joy in work as a key strategy in the pursuit of the Triple Aim. Additionally, healthcare professionals are more likely to be positive about obtaining the best outcomes for patients when they feel respected and supported (IHI, 2017). Organizations are enhancing the strategy of the previous framework by now including four aims: improving the patient experience of care, improving the health of populations, reducing the per capita cost of healthcare, and increasing joy and satisfaction in work life (Bodenheimer & Sinsky, 2014).

As evidenced in the literature, various adult-learning strategies, or andragogy, have improved students' readiness to engage in interprofessional learning. By incorporating IPE into the health science curricula, students may be better prepared to engage in teamwork beyond academia. Literature shows a variety of interactive learning methods at varying levels of education in IPE, and among various health science disciplines. Proven methods utilized in the delivery of IPE experiences include action-based learning; observation-based, simulation-based, practice-based learning; standardized patient learning; and service-learning (The UK Centre for the Advancement of Interprofessional Education, 2002; Bramstedt, Moolla, & Rehfield, 2012; Buff et al., 2015; Cooper, MacMillan, Beck, & Paterson 2009; Grant et al., 2011; Olenick et al., 2010; Zraick et al., 2014).

Positive reactions to student-led IPE have been found in quantitative and qualitative research when an equal learning environment is provided for students. Recent studies have found the student-led method of IPE beneficial in building respect, establishing relationships, empowering one's own profession, and eliminating stereotypes. Results showed that students enjoyed practicing their skills with student teachers, and reported that they enjoyed working with students from other professions (Cooper, et al., 2009; George et al., 2017). Student leadership is essential to the success of IPE, as it improves willingness to collaborate and engage in peer learning (Hoffman, Rosenfield, Gilbert, & Oandasan, 2008). Students are highly receptive to instruction from peer teachers, as the power differential between peer teachers and peer learners decreases in comparison to the power differential between students and teachers (Lehrer et al., 2015). Additionally, student-led initiatives are cost-effective and promote collegiality and socialization (Lehrer et al., 2015).

Wilhelm, Poirier, Otsuka, and Wagner (2014), Sullivan et al. (2015), and Gunaldo (2015) utilized the Readiness for Interprofessional Learning Scale (RIPLS) and additional reflections on student experiences in their research studies to examine the changes in attitudes and IPE learning with this pre- and posttest survey.

Findings revealed that student learning was enhanced and students desired more interprofessional learning. Overall mean scores of the surveys showed improvements in IPE receptiveness, teamwork, and positive attitudes across all professions. Based on student responses from the three studies, students believe that communication, collaboration, respect, and teamwork are essential in interprofessional collaborative care.

Multiple studies have shown that IPE increases knowledge of role clarification, collaborative care, scope of practice, appreciation for other professions, and overlap between professions (Shoemaker, Platko, Cleghorn, & Booth, 2014; Wallace et al., 2016; Wamsley et al., 2012; Hallin et al., 2009). Relevance for future practice resulted in an increased comfort level and confidence for future collaboration with different professions with regard to communication. The aim of this study was to take the proven positive aspects of the various studies in this literature review and put them into one study. Positive aspects include the RIPLS survey, the student-led method, the emphasis on the importance of the Triple Aim, and a variety of effective IPE delivery models for enhanced learning experiences.

The current study examined the following research questions: Does participation in a student-led IPE experience impact students' attitudes toward the roles of other health professions? Does participation in a student-led IPE experience change students' perceptions of interprofessional collaboration? Finally, does participation in a student-led IPE experience affect students' appreciation of teamwork in the academic setting?

Methods

Research Design

The study used a mixed-methods pre- and posttest study design to examine the impact of a student-led IPE experience on health professions students' attitudes and perceptions of interprofessional communication, teamwork, and professional roles. The study utilized a Vets Day IPE workshop community event that involved students collaborating in interprofessional teams; each centered on providing assessments of a veteran patient. The workshop had the capacity to serve 12 veteran patients, with each patient being assigned to an interprofessional team of students. The principal investigator (PI) obtained approval from the Institutional Review Board (IRB) prior to implementation of the study. The study included a student-led IPE workshop preceded by an orientation, followed by a debrief session held four days after the IPE workshop. Participation in the Vets Day IPE workshop was voluntary, and participants were permitted to withdraw from participation at any time during the study.

The face-to-face orientation served four purposes: (1) to orient the students to the agenda and objectives of the Vets Day IPE workshop; (2) to obtain informed consent and pre-test RIPLS results; 3) to facilitate student IPE team member introductions, have students provide their IPE team with a brief description of their profession, and discuss scope of practice and potential interprofessional roles and responsibilities as a member of the IPE team; and (4) to serve as an opportunity for the PI to introduce the study to student members of the IPE teams, explain the consent process, and address any questions relating to the study.

The Vets Day IPE Workshop used the student-led approach and involved students from a variety of health professions who worked together to run the IPE experience, while instructors were present to provide supervision. The student-led teams worked together to gather a health history intake and provide two basic screenings to assess potential hearing problems and sleep problems. In addition to the two screenings, each veteran had the opportunity to receive dental care. A discipline-specific student professional provided each screening, while participants from other disciplines observed. Students were exposed to the roles and responsibilities of other professions and gained insight into the importance of interprofessional collaboration. A student-led debriefing session was held for members of the IPE teams to reflect on their experience. The IPE teams were provided with guided questions to facilitate reflection of their IPE experience, and the debrief session was a student-led discussion.

Participants

Participants were recruited via email from a conve-

nience sample of students enrolled in health science programs at a multicollegiate campus. Participants included students in the following programs: Dental Hygiene, Communication Sciences and Disorders/ Speech and Hearing Sciences, Occupational Therapy, and Health Service Administration. Participation was voluntary, and withdrawal from participation was permissible at any time during the study. Informed consent was provided for both the students and veterans. Each interprofessional team consisted of students from each discipline.

Data Collection

Quantitative data was derived from the validated and modified RIPLS (Readiness for Interprofessional Learning Scale) instrument. The RIPLS instrument is a 19-item survey using a five-point Likert-scale ranging from "strongly agree" to "strongly disagree" (5=strongly agree, 4=agree, 3=neutral, 2=disagree, 1=strongly disagree). The sum of scores ranges from a minimum of 19 to a maximum of 45. Lower scores indicate negative attitudes toward shared learning, and higher scores indicate positive attitudes (Stull & Blue, 2016). The modified version of the RIPLS instrument includes four subscales: teamwork and collaboration, negative professional identity, positive professional identity, and roles and responsibility. The RIPLS survey has been shown to effectively measure the attitudes and perceptions of students toward IPE (Hertweck et al., 2012). The *IPEC Sub-Competencies of Teams and Teamwork and IPE Sub-Competencies of Interprofessional Communication* are the closest related competencies to the RIPLS items. RIPLS items were organized to assess whether students meet these two competencies. Qualitative data derived from six open-ended items was used in the posttest to gather data related to aspects of the IPE experience and the debrief session where data was thematically organized.

Demographic data included student age, gender, program, year of study (in their program), prior IPE experiences, and any other health professions degree or experience. Participants were asked to create a unique identification code to place on the front of the pre- and posttests. The code linked the pre- and posttest for comparison and to ensure validity and confidentiality. Participants who were unable to attend the orientation completed the pretest prior to the workshop and completed the posttest on the same day following the workshop. This research design and implementation ensured that all participants remained anonymous; however, they were asked to identify specific demographics, including their program of study, to allow further investigation into the variety of professions involved in the study.

Data Analysis

All quantitative data was input into SPSS® for statistical analysis. No identifiers other than the unique code participants created were entered into SPSS to ensure anonymity. Due to a limited number of participants leaving questions blank, the degrees of freedom and *t*-tests show that the PI took into consideration the missing values when analyzing data and configuring statistical significance. Frequencies were run through IBM SPSS® to ensure validity of data entered. The PI took each RIPLS pre- and posttest to compare the mean score using a *t*-test (see Table 1). Reverse coding in SPSS was used on specific RIPLS items (9, 10, 11, 17, 18, 19) to reflect changes in reverse scores where a lower score indicates readiness for IP learning. Overall data of the pretest showed a high baseline mean score for each RIPLS item. Paired samples *t*-tests were run to compare changes in the RIPLS survey from pretest to posttest for all participants.

Demographic data was collected on the pretest, giving the PI a wide range of data comparisons. Data was collapsed to more easily compare the program of study, year of study, age, prior degree/experience, and orientation attendance due to sample sizes within each demographic category. Levene's test was run to see if there was a significant difference in the demographics (program, year of study, age, degree/experience, and orientation) and the mean change in the RIPLS total score.

Qualitative data was collected from the posttest open-ended questions and the debrief session, and organized thematically. Quantitative data was representative of all disciplines that participated in the Vets Day IPE Workshop (*N*=46). Qualitative data was representative of students who participated in the debrief session.

RIPLS Item	Maximum Possible Score	Pretest			Posttest		
		n	*M*	*SD*	*n*	*M*	*SD*
Learning with other students will help me become a more effective member of a healthcare team	5	44	4.54	.504	44	4.80	.408
Patients would ultimately benefit if healthcare students worked together to understand clinical problems	5	46	4.67	.474	44	4.86	.347
Shared learning with other healthcare students will increase my ability to understand clinical problems	5	46	4.59	.498	44	4.77	.424
Learning with healthcare students before qualification would improve relationships after qualification	5	46	4.48	.623	44	4.68	.601
Communication skills should be learned with other healthcare students	5	46	4.30	.785	44	4.59	.583
Shared learning will help me to think positively about other professionals	5	46	4.30	.695	44	4.70	.509
For small group learning to work, students need to trust and respect each other	5	45	4.62	.576	44	4.73	.624
Team-working skills are essential for all healthcare students to learn	5	45	4.78	.471	44	4.80	.509
Shared learning will help me to understand my own limitations	5	45	4.02	.753	44	4.59	.658
I don't want to waste my time learning with other healthcare students**	5	46	1.63	.903	44	1.25	.488
It is not necessary for undergraduate healthcare students to learn together**	5	46	1.65	.849	44	1.36	.613
Clinical problem-solving skills can only be learned with students from my own department**	5	46	1.41	.580	44	1.36	.650
Shared learning with other healthcare students will help me to communicate better with patients and other professionals	5	46	4.26	.855	44	4.73	.451
I would welcome the opportunity to work on small-group projects with other healthcare students	5	46	3.87	1.024	44	4.66	.526
Shared learning will help me to clarify the nature of patient problems	5	46	4.22	.664	43	4.70	.513
Shared learning before qualifications will help me become a better team worker	5	46	4.17	.769	44	4.68	.518
The function of nurses and therapists is mainly to provide support for doctors**	5	46	2.09	.939	44	1.89	1.017
I'm not sure what my professional role will be**	5	46	1.83	.877	44	1.50	.762
I have to acquire much more knowledge and skills than other healthcare students **	5	46	2.39	1.022	44	2.16	1.098

Table 1. *Note. *p < .001 and **reverse coded in SPSS, low is a better score. Comparison of Pre- and Posttest for Each RIPLS Item*

Results

Sample

Of the total participants who completed the informed consent (*N*=46), 96% of participants (*n*=44) attended the Vets Day IPE Workshop and completed both the pre- and posttest RIPLS survey. However, when comparing data some participants circled two answers, leaving the PI missing data and the number (*n*) to vary depending on the question answered. Attendance to the orientation included 72% of participants (*n*=33) and the debrief session 56% (*n*=26).

The demographic survey completed at the beginning of the pretest identified the majority of participants, 91% (*n*=42), had prior IPE experience, and 98% of students (*n*=45) were in their first or second year of study in their respective program. The majority of students, 69% (*n*=32), were 18 to 24 years of age, and 98% (*n*=45) were female. Out of all participants, 37% (*n*=17) had another health professions degree or experience. All demographic characteristics and percentages related to this study are included (see Table 2).

Characteristic	Percentage of Sample (*N*=46)
Program of Study	
Dental Hygiene	48% (*n*=22)
Comm D/Speech and Hearing	26% (*n*=12)
Health Service Administration	2% (*n*=1)
Occupational Therapy	24% (*n*=11)
Year of Study	
1st	72% (*n*=33)
2nd	26% (*n*=12)
3rd	-
4th	2% (*n*=1)
Prior IPE Experience	
No	9% (*n*=4)
Yes	91% (*n*=42)
Other Health Professions Degree or Experience	
No	59% (*n*=27)
Yes	37% (*n*=17)
	*two students did not answer this question
Gender	
Male	2% (*n*=1)
Female	98% (*n*=45)
Age	
18–24	69% (*n*=32)
25–34	22% (*n*=10)
35–44	9% (*n*=4)
45–54	-
55+	-

Table 2. *Demographic Characteristics of Vets Day IPE Workshop*

Quantitative Results: RIPLS

A paired samples *t*-test was run to compare the total mean score change in the RIPLS from pretest to posttest for all participants regardless of the program of study, along with comparing the total changes within the RIPLS subscales. Overall, the mean improvement in RIPLS score was 5.9 (t=5.85, df=1,41) with a p value <.05 indicating statistical significance in changes to participants' attitudes and perceptions toward IPE after completing the Vets Day IPE Workshop (see Table 3).

n	Mean Total Score Pretest	Mean Total Score Posttest	Mean Improvement in RIPLS Score	Std. Deviation	t	df	Sig. (2-tailed)
42	81.69	87.60	5.905	6.547	5.845	41	.000*

Note. *$p < .001$

Table 3. *Paired Samples t-test Comparing Total Change in RIPLS Pre- and Posttest*

Due to the significant improvement of a mean change of difference of 5.9 in RIPLS scores, the PI ran a paired samples *t*-test on each individual RIPLS subscale to further test these results. Subscale one, teamwork and collaboration, showed a mean improvement score of 2.2 (SD=3.7, t=3.8) and a *p* value <.05. Subscale two, negative professional identity, showed a mean improvement score of .7 (SD=1.5, t=3.0) and a *p* value <.05. Subscale three, positive professional identity, showed a mean improvement score of 2.3 (SD=2.2, t=6.8) and a *p* value <.05. Subscale four, roles and responsibility, showed a mean improvement score of .7 (SD=2.4, *t*=2.0) and a *p* value <.05. Results showed that no one subscale drove the significance of the findings, as all subscales showed significant improvement in scores, thus supporting the initial results that participants had a positive change in attitudes and perceptions of IPE (see Table 4).

Subscale	Items	n	Mean Improvement in RIPLS Score	Std. Deviation	t	df	Sig. (2-tailed)
1: Teamwork and Collaboration	1–9	43	2.186	3.692	3.883	42	.000*
2: Negative Professional Identity	10–12	44	.682	1.506	3.003	43	.004
3: Positive Professional Identity	13–16	43	2.256	2.161	6.844	42	.000*
4: Roles and Responsibility	17–19	44	.727	2.366	2.039	43	.048

Note. *$p < .001$

Table 4. *Paired Samples t-test Comparing Total Change in RIPLS Pre- and Posttest within Subscales*

Dental hygiene students (*n*=19) were compared to a collapsed group containing all other programs (*n*=23) involved in the study. First-year students (*n*=29) were compared to a collapsed group containing students beyond their first year (*n*=13). The 18–24 age group (*n*=30) was compared to a collapsed group containing all other students ranging from age 25 to 44 (*n*=12). The group of students with another degree or healthcare experience (*n*=16) was compared to a collapsed group containing students without another degree or healthcare experience (*n*=25). Last, the group of students who attended orientation (*n*=30) were compared to students who did not attend orientation (*n*=12). The paired samples *t*-test was run to compare the mean change in the RIPLS total score change from pre- to posttest for each demographic item (see Table 5). The *p* values indicate, regardless of the demographic factors, that the Vets Day IPE Workshop experience improved participants' scores and increased positive response to attitudes and perceptions of IPE.

The Levene's test was run and used to compare results of mean changes in the RIPLS total scores in the study. This nonparametric test showed there was no significant difference in the statistical ranging of variances when comparing demographics, thus indicating the ability to run the equal variance test (parametric test). Independent paired sample *t*-tests were run after the Levene's test and showed that the data is parametric, meaning that it did not have widely ranging variances.

Qualitative Results: Debrief

Qualitative data was derived from the 30-minute debrief session the Tuesday following the Vets Day IPE Workshop, where participants (*N*=26) answered nine

Compared Samples		*n*	Difference in RIPLS Total Score Change	SD	t	df	p value
Program of Study	Dental hygiene	19	2.229	4.989	1.101	40	.278
	All other programs	23					
Year of Study	1st year	29	.138	7.244	.062	40	.951
	Beyond 1st year	13					
Age	18–24	30	1.033	6.424	.458	40	.650
	25–44	12					
Other Degree/Experience	Yes	16	.633	6.706	.295	39	.770
	No	25					
Orientation	Yes	30	.600	6.184	.265	40	.792
	No	12					

Table 5. *Demographics in Paired Samples t-test Comparing Difference in RIPLS Total Score Change from Pre- and Posttest*

guided questions in groups of five to six students. Students participating in the debrief session came from the schools of Dental Hygiene (*n*=12), Communication Sciences and Disorders/Speech and Hearing (*n*=9), Health Service Administration (*n*=1), and Occupational Therapy (*n*=4) (see Table 6). In order to bring variety to the discussion, each group was representative of at least two professions. The debrief session included only students, and the discussion was student led. Each room was audio and video recorded to gather qualitative data (see Table 6).

		Completed	
Program of Study	*N*	*n*	%
Dental Hygiene	22	12	54
Comm D/Speech and Hearing	12	9	75
Health Service Administration	1	1	100
Occupational Therapy	11	4	36
Total	46	26	56

Table 6. *Debrief Session Participation*

The PI reviewed and transcribed the recordings, then thematically organized the data. Themes within each of the nine questions were organized using key terms. Subsequently, major themes were organized as overall categories of student discussions and their experience with the Vets Day IPE Workshop. The five major themes from the debrief session included observation, teamwork, preparation, interest, and delivery (see Table 7).

Thematic Category	Key terms	Debrief responses
Observation	See	"I feel like we always talk about what we do at IPE events, so I liked that we got to see other students perform screenings." "I thought it was great to see and hear how much knowledge about pharmacology dental hygiene students have. And I didn't realize they can look in the mouth and know so much about a patient's medical history."
Teamwork	Collaborate Interact Relationships	"In other IPE experiences we just talked and it felt like our professions were separated and not collaborating much. This was so nice to actually get to interact with each other. " "I liked how interactive this experience was compared to others." "I think it's important that we are starting to build those interprofessional relationships now, so we can continue after school."
Preparation	Orientation	"I was a little unclear on who was supposed to do what because I didn't go to the orientation." "We had to wing it because some students didn't come to the orientation, so we only had a few minutes to talk."
Interest	See more Learn more Wish	"I didn't realize there's so much to know about dental hygiene just from talking to you and that we should actually interact with them more. I wanted to see more of what you do rather than just the health history portion." "I wish more HSA students would have participated because I've worked in hospitals and see how important the administrative role is in health care." "I had no idea what occupational therapists did, so it was great to learn about what they can do."
Delivery	Student-led	"It helps us prepare when we are out in the real world because it will only be us." "Everyone was confident and did what they needed to do or stepped in when needed." "It was nice to learn from each other and do most of it as just students."

Table 7. *Major Themes of Participant Responses in Debrief Session*

Discussion

The results of the RIPLS pre- and posttest survey and qualitative data student-led IPE experience impacted students' attitudes and perceptions toward the roles of other health professions, the perceptions of interprofessional collaboration, and the appreciation of teamwork in an academic setting. Furthermore, incorporation of IPE into academic settings, thus encouraging use of IP collaboration in all healthcare settings, has the potential to reach the Triple Aim goals of improving population health, reducing cost per capita, and improving care and patient experiences (Institute for Healthcare Improvement, 2017). Thus, the student-led approach to IPE proves to be a beneficial option for pedagogy in healthcare education.

The study indicates that it is appropriate to introduce IPE at any time during the students' education, and students' year of study had no impact on their pre- and posttest results. The modified RIPLS pre- and posttest survey results indicate students' overall readiness for interprofessional learning, and the Vets Day IPE Workshop was successful in improving attitudes and perceptions of IPE.

It was recognized through discussion at the orientation and debrief session that students were more engaged due to being in smaller groups and having fewer disciplines participate. During the orientation, student discussions at tables with more than four students appeared to be less engaged than those talking one-on-one

or in smaller groups. It appears that creating smaller IPE teams and incorporating four or fewer disciplines in IPE experiences provides students with better learning experiences and teamwork. A variety of IPE delivery modes can be used to enhance the experience and reach different learning styles. The Vets Day IPE Workshop showed improvement in attitudes, perceptions, and readiness for interprofessional (IP) learning by incorporating practice-based learning, action-based learning, and observation-based learning, all within a service-learning opportunity.

Qualitative data showed that participants were highly satisfied with these active-learning strategies. Participants commented on their involvement in Vets Day and attributed their positive experience to their hands-on learning, which encompassed all of the active-learning strategies above. In addition, quantitative results from the pre- and posttest RIPLS showed that these learning strategies were effective. Utilizing these techniques in IPE experiences may be beneficial in achieving the fourth aim of the Quadruple Aim, finding joy and satisfaction in work, by increasing provider satisfaction at an earlier stage in education.

The student-led method influenced participants in a positive way. Qualitative data results showed that participants enjoyed taking the reigns in their IPE experience. The student-led approach allowed students to take ownership and plan to make their IPE experience unique and useful for their future collaboration with other healthcare professionals. The positive experience and fulfillment of working effectively and efficiently with other health professionals when providing care at an academic level may be beneficial in obtaining the fourth goal of the Quadruple Aim.

Due to data revealing statistical significance of improvement in scores for each RIPLS subscale and the overall mean improvement in the total change of RIPLS score, it can be inferred that both IPEC competencies of interprofessional communication and teamwork were met through the Vets Day IPE Workshop. As healthcare changes and further recognizes the importance of IPE in reaching the goals of the Triple Aim, and the Quadruple Aim in time, these competencies may be used to enforce accreditation standards and help programs construct specific IPE experiences to meet these guidelines.

Future implementation of IPE

For educators, this study shows effective ways to implement IPE to better reach students and encourage the participation of programs to foster interprofessional collaboration. Student benefits from IPE experiences include becoming prepared for and open to interprofessional collaboration as a practicing healthcare professional, engaging in networking experiences and lifelong learning, and understanding of the importance of a collaborative approach to healthcare. Results of this research study indicate the student-led approach as an effective way to provide beneficial IPE experiences for students.

Although this study offers more insight and data to literature, it is not without limitations. Data was collected from a small sample size and was limited with regard to the number of programs involved. A set number of veteran patients (12) was used in this study, which limited the number of participant spots available; however, unfilled spots were present. The unequal distribution of representative disciplines is considered a limitation, as a much higher number of dental hygiene students participated in comparison to other programs. Many students received IPE credit for their specific program for attending the Vets Day IPE Workshop. Although some of the participants were required to have a certain number of hours participating in an IPE event, participation in this study was voluntary. Students have a variety of opportunities and IPE events to choose from throughout their education to meet their program's IPE requirements. Out of the eight programs involved in the study, only two programs (Dental Hygiene and Pharmacy) required IPE hours, and the remaining programs encourage students to participate throughout their course of study. The requirement from the Dental Hygiene Program may have influenced participation and outcomes of the event, as participants were more likely to sign up for an IPE event of this nature in a familiar place; however, involvement in both the IPE event and the study was voluntary in the remaining programs. Outcomes might have varied significantly if all participants had been required at the IPE event.

Dental Hygiene students were affiliated with the PI through their program, which may have impacted the sample size and overall experience. With that said, all students were informed that responses were confiden-

tial—meaning that the PI did not know who answered each pre- and posttest—and dental hygiene students were not shown to have statistically significant variance in their RIPLS scores. Participants were encouraged to answer honestly. All limitations could be considered and improved upon in future research.

Although the orientation in this study did not show a change in results based on attendance, qualitative results revealed that students felt the orientation attendance affected their team performance. Students who attended the orientation felt that participants who did not attend may not have contributed as much to their team. There was a lack of role clarification with teams when only some of the participants attended orientation, which affected the smoothness of team performance. Exploring orientation options may be beneficial for future IPE. Online orientation is an option rather than a face-to-face orientation, and it may alleviate barriers to IPE such as scheduling. Randomly assigning participants to one of the following, for better analysis of the orientation impact, may garner valuable data: face-to-face orientation, online orientation module, and no orientation to act as a control. This may further determine if an orientation is necessary in workshops for community service projects like the Vets Day IPE Workshop.

Conclusion

The results of this study show that a student-led approach to IPE through a community service project is beneficial in improving student attitudes and perceptions of IPE. The Vets Day IPE Workshop was effective in significantly improving post-test RIPLS scores, indicating a positive shift in perceptions of IP collaboration and readiness for IP learning. Data reveals the benefits of utilizing the student-led approach in reaching the IPEC competencies of interprofessional communication and teamwork, which in turn increases the likelihood of the healthcare goal of the Triple Aim. Study findings support the effectiveness of a variety of IPE delivery modes, the student-led method, and the use of the RIPLS survey in determining readiness for IP learning. The study also indicates that the demographics of students have no direct correlation. Regardless of the program of study, age, gender, year of study, prior IPE experience, prior degree, or orientation attendance, results of the RIPLS survey show no variance. All professions showed significant improvement in the readiness for interprofessional learning when the pre- and posttest survey were compared after implementation of the IPE workshop. IPE may be introduced at any time during education to be effective in preparing students for IP collaboration beyond academia.

The future of interprofessional collaboration and improved healthcare starts with a better delivery of IPE. This research study has explored the opportunities and successful techniques to improve students' IPE experiences through the student-led approach, use of several IPE delivery modes, and a framework for future delivery of successful IPE. An increase in interprofessional collaboration leads to patient-centered care, which will aid in moving toward reaching the Triple Aim goals. In future research, pursuing the evolving fourth aim of the Quadruple Aim framework could benefit the success of IPE. This study enriches the future of IPE and healthcare by identifying effective IPE methods and features that may interfere with the success of these experiences.

References

Bodenheimer, T., & Sinsky, C. (2014). From triple to quadruple aim: Care of the patient requires care of the provider. *The Annals of Family Medicine*, *12*(6), 573–576. https://doi.org/10.1370/afm.1713

Bramstedt, K. A., Moolla, A., & Rehfield, P. L. (2012). Use of standardized patients to teach medical students about living organ donation. *Progress in Transplantation*, *22*(1), 86–90. https://doi.org/10.7182/pit2012172

Buff, S. M., Jenkins, K., Kern, D., Worrall, C., Howell, D., Martin, K., . . . Blue, A. (2015). Interprofessional service-learning in a community setting: Findings from a pilot study. *Journal of Interprofessional Care*, *29*(2), 159–161. https://doi.org/10.3109/13561820.2014.934956

Contreras, O. A., Stewart, J., Stewart, D, & Valachovic, R. W. (2018). Interprofessional education and practice: An imperative to optimize and advance oral and overall health. *ADEA Policy Brief*. Retrieved August 2019 from https://www.adea.org/policy/publications/ipe/

Cooper, B. A., MacMillan, B. D., Beck, R. A., & Paterson, M. L. (2009). Facilitating and evaluating a student-led seminar series on global health issues as an opportunity for interprofessional learning for health science students. *Learning in Health & Social Care*, *8*(3), 210–222. https://doi.org/10.1111/j.1473-6861.2008.00212.x

George, L., Bemenderfer, S., Cappel, M., Goncalves, K., Hornstein, M., Savage, C., Altenburger, P., Bellew, J., & Loghmani, M. T. (2017). A model for providing free patient care and integrating student learning and professional development in an interprofessional student-led clinic. *Journal of Physical Therapy Education*, *31*(2), 54–66. https://doi.org/10.1097/00001416-201731020-00007

Grant, L., McKay, L. K., Rogers, L. G., Wiesenthal, S., Cherney, S. L., & Betts, L. A. (2011). An interprofessional education initiative between students of dental hygiene and bachelor of science in nursing. *Canadian Journal of Dental Hygiene*, *45*(1), 36–44.

Gunaldo, T. P., Andrieu, S. C., Garbee, D., Giovingo, L. K., Mer cante, D. E., Tortu, S., & English, R. (2015). Student perceptions about interprofessional education after an elective course. *Journal of Interprofessional Care*, *29*(4), 370–371. https://doi.org/10.3109/13561820.2014.969836

Hallin, K., Kiessling, A., Waldner, A., & Henriksson, P. (2009). Active interprofessional education in a patient based setting increases perceived collaborative and professional competence. *Medical Teacher*, *31*(2), 151–157. https://doi.org/10.1080/01421590802216258

Hertweck, M. L., Hawkins, S. R., Bednarek, M. L., Goreczny, A. J., Schreiber, J. L., & Sterrett, S. E. (2012). Attitudes toward interprofessional education: Comparing physician assistant and other health care professions students. *Journal of Physician Assistant Education 23*(2), 8–15. https://doi.org/10.1097/01367895-201223020-00003

Hoffman, S. J., Rosenfield, D., Gilbert, J. H., & Oandasan, I. F. (2008). Student leadership in interprofessional education: Benefits, challenges and implications for educators, researchers and policymakers. *Medical Education*, *42*(7): 654–661. https://doi.org/10.1111/j.1365-2923.2008.03042.x

Institute for Healthcare Improvement. (2017). The IHI triple aim. Retrieved from http://www.ihi.org/Engage/Initiatives/TripleAim/Pages/default.aspx

Institute of Medicine. (2001). Crossing the quality chasm: A new health system for the 21st century. Washington, DC: National Academy Press.

Interprofessional Education Collaborative Expert Panel. (2011). Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, DC: Interprofessional Education Collaborative.

Lehrer, M. D., Murray, S., Benzar, R., Stormont, R., Lightfoot, M., Hafertepe, M., . . . Maio, A. (2015). Peer-led problem-based learning in interprofessional education of health professions students. *Medical Education Online*. https://doi.org/10.3402/meo.v20.28851

Olenick, M., Allen, L. R., & Smego, R. A., Jr. (2010). Interprofessional education: A concept analysis. *Advances in Medical Education and Practice*, *1*, 75–84. https://doi.org/10.2147/amep.s13207

Shoemaker, M. J., Platko, C. M., Cleghorn, S. M., & Booth, A. (2014). Virtual patient care: An interprofessional education approach for physician assistant, physical therapy and occupational therapy students. *Journal of Interprofessional Care*, *28*(4), 365–367. https://doi.org/10.3109/13561820.2014.891978

Stull, C. L., & Blue, C. M. (2016). Examining the influence of professional identity formation on the attitudes of students toward interprofessional collaboration. *Journal of Interprofessional Care*, *30*(1), 90–96. https://doi.org/10.3109/13561820.2015.1066318

Sullivan, K., Charrette, A., Massey, C., Bartlett, D., Walker, C., Bond, I., & Fong, J. J. (2015). Interprofessional education with a community fall prevention event. *Journal of Interprofessional Care*, *29*(4), 374–376. https://doi.org/10.3109/13561820.2014.969834

The UK Centre for the Advancement of Interprofessional Education (2002). Interprofessional education: Today, yesterday and tomorrow: A review. *Learning & Teaching Support Network*, 1–47.

Wallace, S. E., Sammarone Turocy, P., DiBartola, L. M., Deluliis, E. D., Astle, J., Cousino, S., … Weideman, Y. (2016). Interprofessional education workshop outcomes: Learning and understanding professional roles in stroke care. *Journal of Physical Therapy Education*, *30*(3), 50–60. https://doi.org/10.1097/00001416-201630030-00009

Wamsley, M., Staves, J., Kroon, L., Topp, K., Hossaini, M., Newlin, B., … O'Brien, B. (2012). The impact of an interprofessional standardized patient exercise on attitudes toward working in interprofessional teams. *Journal of Interprofessional Care*, *26*(1), 28–35. https://doi.org/10.3109/13561820.2011.628425

Wilhelm, M., Poirier, T., Otsuka, A., & Wagner, S. (2014). Interprofessional ethics learning between schools of pharmacy and dental medicine. *Journal of Interprofessional Care*, *28*(5), 478–480. https://doi.org/10.3109/13561820.2014.911722

World Health Organization. (2010). Framework for action on interprofessional education & collaborative practice. *Health Professions Networks Nursing & Midwifery Human Resources for Health.* Retrieved from http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf

Zraick, R. I., Harten, A. C., & Hagstrom, F. (2014). Interprofessional education and practice: A primer for training future clinicians. *Perspectives on Issues in Higher Education*, *17*(2), 39–46. https://doi.org/10.1044/aihe17.2.39

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