

DPT and PA Student Perceptions on an Interprofessional Service-Learning Project for Pain Education in an Underserved Population

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Abstract

Interprofessional education (IPE) opportunities are a necessary component of healthcare education that allow students to develop the skills needed for real-world practice. Fifty-four doctor of physical therapy and physician assistant students participated in an interprofessional education service-learning project by delivering musculoskeletal pain education content to underserved communities. Thematic analysis of student reflections revealed the following major themes: patient/client education, interprofessional collaboration and opioid alternative treatment. Implications for future education and practice are discussed.

Keywords: patient/client education, interprofessional collaboration, opioid use disorder, communication, community engagement

1. Introduction

Indiana State University (ISU) has a long history of participation in community engagement activities, achieving national accolades for the extensive work of its students and faculty (Washington Monthly, 2021). The mission of the ISU College of Health and Human Services [CHHS] (2024) includes “community outreach,” and its vision is “To be a leader in the development of professionals who will positively impact communities” (p.1). Both the Physician Assistant (PA) Program and the Doctor of Physical Therapy (DPT) Program mission statements focus on improving the health of rural and/or underserved communities.

In the fall of 2023, the ISU DPT and PA programs participated in a series of interprofessional education (IPE) activities, which culminated in a community event for adults who suffer from musculoskeletal pain. The target population included young, middle-aged, and older adults who reside in a rural and historically underserved area in a small town in the Midwest. The topic of musculoskeletal pain was chosen because both physical therapists and physician assistants treat these diagnoses on a consistent basis. In addition, research suggests that 47% of the general population has experienced this problem; nearly half of those suffer long-lasting issues (El-Tallawy et al., 2021).

In order to understand DPT/PA student perceptions of community engagement activities implemented in an interprofessional manner, all students were required to complete a written reflection at the conclusion of the service-learning assignment. During the grading of these reflections, instructors noticed an overall positive response, suggesting that the IPE event provided a meaningful learning experience. Additionally, the literature is lacking in published studies demonstrating the effects IPE combined with service learning may have on DPT and PA student professional development (Nagel et al., 2024). Therefore, a retrospective study using thematic analysis to develop a more in-depth understanding of student perceptions was conducted.

2. Literature Review

2.1 Interprofessional Collaboration for Optimized Patient Outcomes

Interprofessional collaboration (IPC) plays a crucial role in improving patient outcomes and addressing complex health challenges, such as opioid use disorder and opioid misuse. Ballantyne (2017) highlights the overprescription of opioids for chronic pain as a significant factor in the opioid epidemic, pointing to an overemphasis on pain scores and an underestimation of addiction risks. This underscores the need for a multidisciplinary approach in chronic pain management that integrate non-opioid therapies and focus on patient functionality rather than solely on pain relief. By involving various healthcare professionals such as physicians, physician assistants, occupational therapists, social workers, and physical therapists in treatment planning and patient care, a more comprehensive and balanced approach can be achieved which can in turn potentially reduce the reliance on opioids and improve overall patient health outcomes.

Effective IPC also enhances communication skills and clarifies the roles and responsibilities of healthcare providers which is vital as they transition from classroom education to real-world practice. According to Yealy et al. (2019), while pain education is included in most PA programs, there is a significant variation in how it is delivered as well as the emphasis placed on it. This inconsistency can lead to gaps in knowledge and preparedness among new healthcare professionals. Implementing robust IPE programs, as discussed by Kauff et al. (2023), can help bridge these gaps. Such programs foster a collaborative mindset and equip students with the skills necessary for effective teamwork that includes addressing stereotypes and enhancing mutual respect among different health professions. Horbacewicz and Molinsky (2024) further support this by showing that participation in IPE activities enhances graduates' likelihood to engage in IPC, highlighting the long-term benefits of such educational initiatives. Knecht-Sabres et al. (2023) found that students valued IPE opportunities which enhanced their understanding of different professions and improved their comfort and ability to collaborate and communicate with other professionals.

Moreover, interprofessional education promotes a better understanding of each profession's unique contributions, consequently leading to more efficient and coordinated care. The Centre for the Advancement of Interprofessional Education [CAIPE] (2019) emphasizes that learning about, with, and from each other in a structured educational setting can break down professional silos and build a foundation for collaborative practice. Boos et al. (2022) add that integrating IPC principles into experiential learning curricula (such as those involving graduate physician assistants and physical therapy students) enhances clinical skills and fosters a culture of continuous learning and adaptation. These competencies are crucial in a healthcare landscape that relies increasingly on team-based care to manage chronic conditions and improve patient outcomes. As healthcare challenges evolve, preparing future healthcare providers through IPE becomes indispensable for addressing the dynamic needs of patients and the healthcare system as a whole. Interprofessional education is vital for preparing future providers to meet the dynamic needs of patients and the healthcare system therein fostering effective patient education for optimized outcomes.

2.2 Patient Education

Individuals with lower levels of health literacy are reported to have poorer health outcomes and higher levels of chronic pain (Miller-Matero et al., 2024). The ability to make decisions and judgments regarding one's healthcare by understanding and integrating the knowledge based on health information received in order to improve or maintain one's quality of life is defined as health literacy (Van der Scheer-Horst et al., 2023). Miller-Matero et al. (2024) reported that healthcare providers hold a responsibility to provide information to patients that is comprehensible and readily available based on the client's level of health literacy. Evidence shows that healthcare providers still lack the use of literacy assessments and the ability to deliver health information at a level understood by patients.

A strong correlation was previously identified between aging and impaired health literacy. As aforementioned, poor health literacy is linked to negative health outcomes, including increased risk for mortality among the aging population (Lima et al., 2024). Lower socioeconomic status and education level, poorer health, language barriers, and lower levels of social support (including social support offered by health personnel) was linked to lower levels of health literacy among aging adults. A study by Diwan et al. (2016) aimed to describe and evaluate the experiences of undergraduate and graduate healthcare students following their participation in a community health promotion and IPE event for aging adults. The qualitative analysis revealed that the students found communication with older adults to be a barrier to the provision of healthcare services. The results of the study validate the need for ongoing exposure to gain experience and proficiency in communicating with older adults in order to promote healthy aging and prevent poor health outcomes.

Both physical therapists and physician assistants share responsibility for providing patient education in a multidisciplinary environment. Individualized patient education enables patients to self-direct care by empowering decision-making and management of health-related diseases (Forbes, 2017). While the benefits of ongoing patient education are known, research shows that healthcare providers do not engage generally in patient education, particularly throughout treatment. Forbes goes on to report that training in how to provide patient education in a realistic setting by engaging with community dwellers and applying learned communication skills should aid in improving the overall patient education process. Service-learning projects have shown to enhance skills in patient education dissemination as well as influence students' perceptions of working with diverse populations (Diwan et al., 2016; Forbes, 2017).

2.3 Service Learning

The process of service learning has been described as “a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities” (Seifer & Connors, 2007, p.5). Doctor of physical therapy students use service learning to provide population-based health promotion programming to underserved populations (Tapley & Patel, 2016), administer the annual physical therapy checkup (Tapley et al., 2021), and deliver physical health screenings to individuals with intellectual disability (Tapley et al., 2019). Physician Assistant students show improved leadership skills and interest in social justice through service-learning activities with inner-city organizations such as shelters, rescue missions, and soup kitchens (Knight et al., 2007). Service learning in Physician Assistant education is described as a high-impact teaching practice that is underutilized (Oliveira et al., 2023).

2.4 Synthesis of Literature Review

The existing literature supports the value of service learning, patient education, and interprofessional collaboration in healthcare education. Prior research demonstrates that service learning enhances students' civic responsibility and clinical reasoning, while patient education improves health outcomes and empowers patients to engage in their care when administered at a level known to them, which is not often achieved in healthcare. Additionally, IPE fosters teamwork and communication among healthcare professionals, contributing to more effective, patient-centered care. However, a gap remains in understanding how these components specifically influence the professional development of Doctor of Physical Therapy (DPT) and Physician Assistant (PA) students when combined in an immersive IPE setting.

This gap highlights the need for a qualitative research study exploring the effectiveness of such collaborative experiences in shaping the clinical, interpersonal, and reflective skills of DPT and PA students. By examining the DPT and PA student development through shared service learning and patient education initiatives, this study aims to provide insight into how DPT and PA students perceive that IPE environments prepare them as future healthcare providers in regard to interprofessional practice, ultimately improving patient outcomes and fostering a more collaborative healthcare culture.

2.5 Purpose

The purpose of this retrospective study was to explore the perceptions of DPT and PA students on how participation in an IPE service-learning activity impacted their development as future healthcare providers. The question that guided the study was:

1. What are the perceptions of DPT/PA students of how participation in an IPE service-learning activity impacted their development as future healthcare providers?

A qualitative design was the optimal choice as the literature is lacking in published studies demonstrating the effects IPE combined with service learning may have on DPT and PA student professional development (Nagel et al., 2024). This approach allowed for an in-depth exploration of student perceptions, capturing nuanced insights that quantitative methods might overlook.

The primary focus of the research was to understand students' perspectives on the development of their clinical, communication, and collaboration skills. Secondary, exploratory questions considered how the experience shaped their attitudes toward patient education and working with diverse populations. The retrospective nature of the study permitted students to reflect on their growth over time, offering a more comprehensive view of how the service-learning activity contributed to their professional development.

The research design supports the ability to draw meaningful inferences by prioritizing rich, descriptive data collected through written discussion board reflections. This method allowed participants to express their thoughts openly,

fostering authentic narratives that provided a deeper understanding of the IPE service-learning experience's impact. By centering the study on student perceptions, the research aims to inform future curriculum development, ensuring that IPE and service-learning activities are purposefully designed to enhance interprofessional collaboration and patient education competence. Furthermore, integrating these approaches can help DPT and PA students cultivate essential teamwork and communication skills, ultimately optimizing patient outcomes through more cohesive, collaborative healthcare delivery.

3. Methods

3.1 Design

The research study utilized a retrospective qualitative design tailored to allow participants to describe their experiences and perceptions of how participation in an interprofessional education opportunity influenced their development toward becoming licensed physical therapists or physician assistants. Data were collected through the required written discussion board reflection using the Canvas course management system to discover common themes amongst both physical therapists and physician assistants, as well as those unique to each profession. A qualitative design was chosen to gain a deeper understanding of the student's views regarding the impact that an interprofessional education opportunity has on the development of becoming licensed healthcare providers.

The interprofessional service-learning project began with an initial planning session that was held during week one of the fall semester of 2023 to describe the project and answer student questions. During this session, students self-enrolled in groups and began writing goals and objectives for their projects. Each group elected a project manager whose responsibilities were to coordinate group activities and communicate with the two primary course instructors. All outreach activities were required to include a medical overview of common conditions resulting in musculoskeletal pain as well as their associated epidemiology, pathophysiology, and diagnostic information. Additionally, prevention strategies and early interventions were required elements. All groups were asked to include screening and prevention of substance use disorder and prevention of opioid misuse amongst patient populations who experienced pain.

During week seven of the semester, a second organized IPE meeting was held to bring the groups together again for further planning under instructor supervision. Students were asked to review and finalize their goals/objectives, review their lesson plan (e.g., content, delivery methods, personnel assignments, etc.), create a marketing plan, and list action items heading into the remainder of the semester. Shared Google documents were used to facilitate group activity and communication of ideas.

Beginning in week nine, each group delivered one 2-hour session to their target population. Many subjects were recruited from the Osher Lifelong Learning Institute [OLLI] (2024), a not-for-profit organization dedicated to promoting the joy of learning and personal fulfillment in older adults. Other participants were members of a local senior center or university students. Four groups delivered interactive presentations in a classroom setting, while two groups utilized table setups in a "health fair" type setting in a common area of the college. Ninety-five community members participated in the various events.

3.2 Setting and Sample

In the fall semester of 2023, twenty-six 3rd-year DPT students and twenty-nine 1st-year PA students were required to participate in interprofessional service-learning projects. This activity fulfilled course assignments in PHTH 820 Health Promotion Outreach for DPT students and PASS 636 Clinical Management II for PA students. In order to provide a student-centered learning experience, students were allowed to self-enroll into one of 6 groups based on their own personal interests: 1) Head and Neck Pain, 2) Low Back Pain, 3) Common Lower Extremity Musculoskeletal Disorders, 4) Common Upper Extremity Musculoskeletal Disorders, 5) Common Musculoskeletal Disorders in Young Adults: Prevention and Early Intervention (Health Fair for University Students), and 6) Common Musculoskeletal Disorders for Older Adults: Prevention and Early Intervention (Health Fair at a Local Senior Center). Equal distributions of DPT/PA students were required in each group to facilitate the IPE experience. All 55 students completed a required written discussion board reflection using the Canvas course management system following the conclusion of the service-learning projects.

3.3 Ethical Considerations

This study was reviewed and approved by the ISU Institutional Review Board and categorized as Exempt as retrospective data from student reflections were utilized after the student's participation in the course had concluded. Confidentiality of the reflections was maintained by redacting the student names prior to analysis by an individual

not involved in data analysis. All authors have indicated no conflicts of interest in the completion and publication of this study. Additionally, no direct risks were identified by the researchers for participation in this study.

3.4 Measures and Covariates

Students were asked to write a reflection on the DPT/PA IPE service-learning activity that answered the following question: In what ways has this activity helped to develop you into a better physical therapist/physician assistant? The question was designed as there has been a lack of studies that have demonstrated the effects IPE combined with service learning may have on DPT and PA student professional development (Nagel et al., 2024). Therefore, to fill the gap and better understand the potential impact that participation in an IPE can have on DPT and PA student professional development, an open-ended question on the ways the activity may have contributed to development was established. The question was created with the contribution of an experienced qualitative researcher. The content validity of the questions was achieved through feedback from the PA instructor involved in the project. In the spring semester of 2024, the decision was made to perform a thematic analysis of these student comments to ascertain further the true meaning of this event and its effect on student learning.

The authors performed a thematic analysis utilizing the method outlined by Braun and Clarke (2006). This method uses thematic analysis to identify, analyze, and report patterns or “themes” observed in a cluster of comments. It is a flexible method allowing differing approaches and applications to a variety of data types and disciplines. The six-step process is summarized in Table 1. For the purpose of this paper, the authors entered the analysis without any preconceived notions or expectations. Reflections were downloaded from Canvas, and researchers redacted the student names prior to analysis. The tedious process of initial review, coding, and development of themes, as described below, was performed over a period of several weeks.

Table 1. The Six Phases of Thematic Analysis

Phase	Description of the Process
1	Become Familiar with Data Transcribe recordings, read and re-read, Make note of initial ideas
2	Generate Initial Codes Systematically code interesting features of data Collate related data
3	Search for Themes Collate codes into potential themes
4	Review Themes Consider if themes make sense Generate a thematic map
5	Define/Name Themes An ongoing analysis to determine final themes Name and define themes
6	Produce the Report Final analysis of data Include good examples to include in report Relate findings to research question and Literature

*Adapted from Braun & Clarke, 2006

The six phases of thematic analysis, as described by Braun and Clarke (2006), are shown in Table 1.

4. Results

4.1 Recruitment

No recruitment was performed or required as retrospective data was utilized based on students' completion of a required written discussion board reflection using the Canvas course management system in the fall semester prior to the conduction of the study and thematic analysis.

4.2 Data Analysis

The results of the thematic analysis, which can be visualized in Figure 1, utilizing the steps outlined in the methods section, revealed a major theme: Interprofessional Collaboration with no identified subthemes, and a second major theme: Patient/Client Education with subthemes- Patient/Client-centered Communication, Importance of Education, and Kinesiophobia (the fear of movement) by the DPT students. The PA students also identified the major theme of Interprofessional Collaboration with the addition of subthemes- Importance of Teamwork, Communication with Other Healthcare Professionals, and Roles and Responsibilities. In addition, the PA students identified two other major themes: Patient/Client Education and Opioid Alternative Treatments, with no subthemes identified.

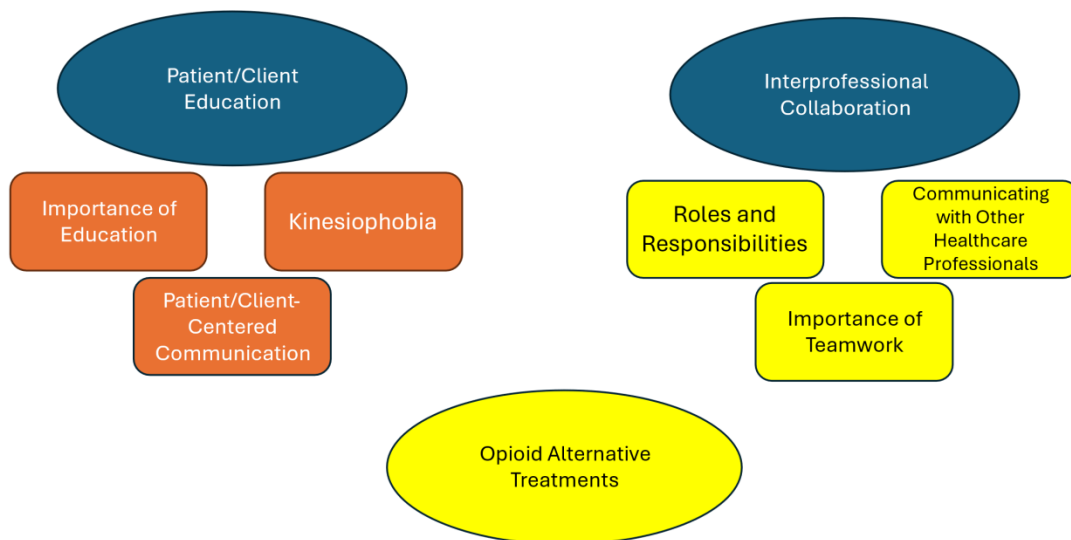


Figure 1. Thematic Map

Figure 1 describes the major themes (oval shapes) and subthemes (rectangles) identified by the physical therapy students (orange), physician assistant students (yellow), and both health professions (blue).

4.3 Opioid Alternative Treatments

The theme, Opioid Alternative Treatments, was identified based on the statements regarding the awareness and knowledge gained by the PA students regarding numerous exercises, modalities, and “various home remedies” to offer “less invasive measures” in the treatment of their clients’ musculoskeletal pain complaints. Sample student reflections are provided in Table 2.

Table 2. Opioid Alternative Treatments: Sample Student Comments

General Comments

“Expanded my knowledge of alternative methods for pain relief”

“Less invasive measures may be the goal for some patients.”

“I am more equipped to provide alternatives to invasive pharmacological measures.”

“I am aware of different exercises...for different painful conditions.”

“I was able to learn about transcutaneous electrical nerve stimulation and dry needling.”

“Various home remedies”

Table 2 includes a compiled list of student comments regarding opioid alternative treatments to add to the richness of the data.

4.4 Interprofessional Collaboration

Interprofessional Collaboration was identified as a major theme across both student groups based on the students’ reported connection between interprofessional service-learning projects and expected future “collaborations within a multidisciplinary healthcare team.” The PA students appeared to diverge on the theme, perhaps due to their team-oriented practice settings; thus, the subthemes- Importance of Teamwork, Communication with Other Healthcare Professionals, and Roles and Responsibilities were identified.

Several of the PA students’ reflections went on to describe how important interprofessional collaboration is to patient outcomes, therefore defining the subtheme- Importance of Teamwork. One PA student reported that “often it is beneficial to the patient to consult others that have expertise in the issue you are trying to solve.” Patient outcomes were reinforced when discussing how communication with other healthcare professionals can aid in “crossing information gaps” and support the “goals and needs of the patient” through open lines of communication. Many of the PA reflections also reinforced the importance of optimizing patient outcomes, which coincided with understanding one’s roles and responsibilities within the healthcare team. The aforementioned is how the subtheme of Roles and Responsibilities was identified. One PA student commented that knowing “how other medical professionals treat patients gives me options for who and when to refer patients” by “establishing a clear idea of what each provider’s role is.” Additional sample student reflections are provided in Table 3.

Table 3. Interprofessional Collaboration: Sample Student Comments

General Comments

“I ...learned about what role PAs play in pain management, developed connections with another profession that could aid me and my patients in the future.”

“Better participate in multi-disciplinary care in the future.”

“Understand the roles each person would take in the treatment of a patient.”

“Utilizing an interprofessional collaborative approach to create a positive impact”

“How to collaborate with others”

“We surely will work with countless other healthcare providers in our careers.”

Subtheme: Importance of Education

“PAs are part of a multidisciplinary team and consistently interact with other specialties.”

“As PAs, we will always be working with many different professions.”

“Merging our skills clinically allowed me to see how well these two disciplines work together and how important their relationship is to patient outcomes.”

“Be more considerate as to how beneficial physical therapy can be for patients.”

Subtheme: Communication with other Healthcare Professionals

“Crossing information gaps through communication.”

“The more [PAs and PTs] communicate, the better the patient outcomes can be.”

Subtheme: Roles and Responsibilities

“Understand when I would refer a patient to PT.”

“Get them [the patient] additional professional care they may need.”

“This activity provided insight into physical therapy and how they practice.”

“It is valuable for me to learn what exactly happens after that referral to PT.”

“How other medical professionals treat patients gives me options for who/when to refer.” “Establishing a clear idea of what each provider's role is”

Table 3 includes a compiled list of student comments regarding interprofessional collaboration to add to the richness of the data.

4.5 Patient/Client Education

The theme of Patient/Client Education was identified as a major theme across both student groups secondary to the exposure of servicing an underserved population. Both the PA and DPT students reported on the unique challenges faced in “educating people who do not work in the medical field” and the requirement to “tailor our language” for comprehension by the patients or audience. Within this major theme, the subthemes of Importance of Education, Patient/Client-Centered Education, and Kinesiophobia may have arisen during the analysis of the third-year DPT students' reflections secondary to the students having been on clinical rotations with direct exposure to patient care. Unlike the DPT students, the PA students were in their first didactic year and had limited exposure to direct patient care thus far, though they were required to have experience with direct patient care prior to admission into the program.

The DPT students commented on how this IPE allowed them experience “to explain more complicated concepts in a simple...manner”, and how this project “helped me develop skills” in simplifying medical jargon that is understandable to patients. Furthermore, the DPT students reflected on how important education is for patient compliance and autonomy. One student's reflection stated, “There is a calming sense in truly understanding what is going on and how they [the patient] can work on it [musculoskeletal pain] to get better.”

The final subtheme within Patient/Client Education was Kinesiophobia. The DPT students expressed how they are now more equipped “to identify kinesiophobia in patients and provide education to help them overcome it”, and how they may specifically educate patients on the “correlation between injury and fear avoidance.” Comments in this subtheme expanded on the knowledge gained from preparing and researching musculoskeletal pain disorders and the role that physical therapists and physician assistants can play in the prevention and treatment of chronic pain disorders. Table 4 contains additional sample student reflections.

Table 4. Patient/Client Education: Sample Student Comments

General

- “It gave me experience educating people who do not work in the medical field.”
- “It helped me learn how to explain things to people outside of the healthcare profession.”
- “Communicating with patients of varying educational levels”
- “Ability to speak to audiences and patients”
- “How to properly educate future patients on opioid usage”

Subtheme: Patient/Client-Centered Communication

- “To describe and educate findings clearly and succinctly”
- “The best way to relay information to a patient in the most efficient way possible”
- “How to translate concepts into Layman’s terms”
- “To explain complicated concepts in a simple manner”

Subtheme: Importance of Education

- “There is a calming sense in truly understanding what is going on and how [the patient] can work on it [musculoskeletal pain] to get better.”
- “To break down [concepts] into something they will easily be able to remember”
- “Importance of education”
- “Importance of making information understandable”

Subtheme: Kinesiophobia

- “To identify kinesiophobia in patients and provide education to help them overcome it”
- “Correlation between injury and fear avoidance”

Table 4 includes a compiled list of student comments regarding patient/client education to add to the richness of the data.

5. Discussion*5.1 Opioid Alternative Treatment*

Opioid Use Disorder (OUD) is a growing public health crisis that poses significant challenges across various aspects of healthcare. As highlighted by Ballantyne (2017), effectively preventing and treating OUD requires a collaborative approach involving multiple disciplines. This is particularly relevant for future healthcare providers who will encounter patients struggling with chronic and acute pain management frequently during their careers. With that said, it is encouraging to see that students from the DPT and PA programs reported feeling more prepared to address OUD. They expressed confidence in their ability to educate patients about the disorder as well as offer alternative pain management strategies which are crucial components of a comprehensive approach to OUD.

It is noteworthy that PA students were educated by their DPT peers on less invasive treatments for pain as opposed to use of opioids. These treatments included exercises, home remedies, as well as the use of dry needling or TENS units. Peer learning, in which students teach and learn from each other, is a well-established educational strategy with proven benefits for understanding and knowledge retention (McLeod et al., 2018). These efforts can decrease the overuse of opioids and provide alternative treatments for pain.

5.2 Patient/Client Education

It is not surprising that DPT and PA students identified patient/client education as a major theme of this learning experience. Students pointed to the importance of education as well as the requirement for it to be tailored to the

target population. The need to develop thorough, personalized and concise patient handouts, in addition to oral instruction, was identified as a needed resource to improve patient care through shared decision making since these have the potential to enhance patient satisfaction and health literacy (Bhattad & Pacifico, 2022). These authors also found that incorporating the patient educational materials into the electronic medical record and patient portals makes this process faster, more efficient and more effective. Moving forward, this should be a consideration for PA and DPT students during their clinical careers after graduation. In addition, the Agency for Healthcare Research and Quality [AHRQ] (2024) stated that healthcare is most effective when patients have a good understanding of their health problems and are actively engaged in the process of selecting medical treatment. According to the organization, practitioners should assess, select and create easy-to-understand materials and use a systematic method to evaluate print and audiovisual material. This might involve making the purpose of the material completely evident, avoiding distracting content, using common everyday language, and using the active voice. Moreover, clinicians should use effective methods to deliver health education messages like use of “chunks” of information in short sections and address the user directly when describing actions.

5.3 Interprofessional Collaboration

Interprofessional collaboration is necessary to provide quality and comprehensive care to patients while optimizing patient outcomes. Smith and Anderson (2018) state that interprofessional education that engages students in the skills required for successful interprofessional collaboration is one tool for ensuring that thereafter it is achieved. The results of the case report by Smith and Anderson align with those of the current study in that the healthcare students reported higher levels of understanding regarding the importance of being an effective team member, the roles and responsibilities of various professions, and communication with other healthcare students following an IPE activity with standardized patients. Student reflections indicated that the IPE activity provided assurance and comfort regarding future interprofessional collaborations. Another mixed methods study by Winkler et al. (2021) aimed to evaluate the impact of student perceptions, through an IPE workshop with students from eight healthcare programs, on interprofessional collaboration and confidence in working with an elderly population. The themes that arose from the qualitative results included not only role clarity and appreciation for roles but also preparedness to work with the aging population. By developing a care plan as a team and through interactions with the standardized patient, the students felt more prepared to provide collaborative and comprehensive patient care. The findings of this study mirror those of Winkler et al. with respect to the PA and DPT students, who also reported how necessary interprofessional collaboration is to patient outcomes. By understanding each other's roles in pain management, the students were able to educate the participants better on musculoskeletal pain and management. Thus, the findings of this study are consistent with current research in that IPE activities are effective in developing interprofessional collaboration skills and should be integrated consistently into the healthcare curriculum.

5.4 PA/DPT IPE/Service Learning

Published research is sparse in assessing the effectiveness of DPT/PA IPE activities. Hadley et al. (2018) designed and implemented a combined PA, DPT, Pharmacy, and Occupational Therapy (OT) IPE workshop using a stroke case-based activity and the jigsaw technique to facilitate student discussion. Summative assessment using student surveys found that students had positive perceptions of the experience overall. Likewise, McCallister et al. (2020) compared synchronous and asynchronous delivery methods to a group of DPT/PA students for an IPE activity. The experience included objectives to determine the roles and responsibilities of each profession and a utilization of a case study with a hypothetical diabetes patient for patient treatment and planning. Though no differences were noted based on delivery method, students in all groups reported that the IPE objectives were met. One published article was found where DPT, PA, OT, and dental hygiene students participated in an international service-learning project where students wrote reflections during their immersive experience (Cerny et al., 2018). As a whole, students showed improved patient interview skills and enhanced cultural competence. Student reflections indicated an appreciation for the role of interprofessional teams, specifically when considering patient care. The current project results match the results of the aforementioned studies however, it is unique in that no published research exists analyzing DPT and PA students working solely together in a service-learning project.

5.5 Limitations

This study is limited due to DPT and PA students at one midwestern university in the United States. It does not provide the perceptions of DPT and PA students from other programs or DPT/PA students that are or have attended this midwestern university outside of the students that participated in this study, leading to the limits in size and scope impacting the generalizability of the study's findings. Additionally, the study was limited due to the subjective nature of the data.

5.6 Future Research

Future research should explore the perceptions of the participants participating in the service-learning project, or one similar, to optimize participation in such ongoing projects. The project should also be carried out at other universities to increase the impact and improve the generalizability of the findings. Additional research should also study the potential long-term impact of these activities on future practice patterns of physician assistants and physical therapists in a longitudinal study approach.

6. Conclusion

There is a societal responsibility for healthcare workers to participate in ongoing collaboration in order to deliver optimal patient care (Ramiscal et al., 2022). This requires extensive training in an academic setting to prepare future healthcare professionals to deliver effective care in a multidisciplinary setting. Interprofessional education events have been effective in positively impacting knowledge of roles and responsibilities, skills in providing effective communication, and attitudes toward collaboration. While developing and implementing IPE events can be a challenge within the curriculum, they have been shown to ultimately improve the delivery of services to patients, resulting in heightened patient outcomes.

This study contributes to the growing body of work demonstrating the effects of professional development among DPT and PA students during an IPE service-learning project. The students were able to identify the impact that patient-centered communication can have on patient outcomes and autonomy for decision-making regarding one's healthcare when delivering to clients in an underserved population. In addition, this learning experience provided knowledge of different musculoskeletal disorders and how to collaborate and communicate with members of a healthcare team to provide optimal pain management strategies to enhance patient quality of life.

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Authors' contributions

Ms. Elwood and Dr. Howell Tapley were responsible for initial planning and implementation of the service learning/community engagement projects. Dr. Mix and Dr. Tapley were responsible for study design, data analysis and results. Dr. Stasia Tapley wrote and edited much of the introduction and discussion with assistance from all other authors. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

This was a retrospective study and informed consent was not required. The study was approved by the IRB at Indiana State University.

Ethics approval

The Publication Ethics Committee of Sciedu Press.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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