

Use of a Case-Based Blended Educational Session to Improve Physical Therapy Intraprofessional Knowledge and Attitudes

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Abstract

INTRODUCTION Research suggests that physical therapists' (PT) perceptions of physical therapist assistant (PTA) roles are incongruent with PTAs' level of training and that these inaccurate perceptions may impede collaborative work. Interprofessional education—learning with, from, and about other students in different professions—results in improved understanding between health profession students and subsequent improved healthcare team function and patient outcomes. Connecting PTs and PTAs during their academic careers can promote improved clinical collaborations, but logistics often prevent these encounters.

METHODS We developed a pilot, mixed-methods, blended education intervention with PT and PTA students from local programs to determine if this intervention can positively affect knowledge, attitudes and beliefs of PT and PTA students about each other. A PT and PTA instructor conducted the educational session. PT and PTA students completed pre-readings and met face-to-face for a case-based interactive session regarding state regulatory and supervisory requirements. We evaluated knowledge about state regulations and license requirements using a 6-item pre-post session knowledge quiz about state regulations, attitudes and belief using a pre-post Readiness for Interprofessional Learning Survey, and general session feedback with an electronic post-course feedback survey.

RESULTS Knowledge scores significantly improved for PT and PTA students. PT students significantly improved in the “Teamwork and collaboration” Readiness for Interprofessional Learning Survey sub-domain. Qualitative comments were that both groups of students enjoyed interacting and learning about each other's educational requirements and wanted more time together.

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Introduction

As the US healthcare environment moves towards stronger team-based care, many specialties are grappling with creating positive interprofessional collaborations. Interprofessional education is becoming a mainstay in university health profession programs. Unfortunately, little attention has been paid to intraprofessional collaborations and collaborative education of learners from within disciplines. In occupational therapy programs, results of collaborative intraprofessional education results in improvements in intraprofessional communication and relationship strength (Nardella et al., 2018). These collaborations can have a positive impact on patient care (Plack et al., 2006).

Literature Review

Educational interventions to enhance physical therapy (PT) and physical therapist assistant (PTA) collaboration have included collaborative internship experiences, face-to-face interactive sessions delivered by rotating amongst four stations or through case-based learning, and a comprehensive three-staged active learning strategy (lecture, state chapter meeting, and class presentation) (Brooks & Gorman, 2017; Colgrove & VanHoose, 2017; Hawthorne, Cohoon, & Chambers, 2017). Colgrove and VanHoose (Colgrove & VanHoose, 2017) observed a positive change in attitudes and beliefs about PTAs by PT students comparing perceptions post-case-based learning versus post-clinical experiences. Brooks' (Brooks & Gorman, 2017) three-staged active learning strategy resulted in improvements in teamwork and collaboration between PT and PTA students. While the potential to improve care through intraprofessional training is large, these interventions relied on traditional clinical collaborations or time-intensive activities that require PT and PTA students to interact at multiple points throughout training. A gap in the literature exists regarding brief, blended learning interventions where face-to-face learning is combined with online experiences

Activity Design

In this pilot study, we used a mixed-method study with pre-post quantitative and post-session descriptive qualitative (with free-text feedback) design. We applied blended (students completed pre-class activities) and active educational strategies into a concise, one-time session. Objectives of this intervention were

to increase knowledge about state regulatory and supervisory requirements for PT and PTA students, improve overall appreciation of each group of students for the other, and foster a greater understanding of PT and PTA educational requirements and collaboration.

Subjects

The convenience sample consisted of second-year PT students from the University of Wisconsin-Madison (UW-Madison) and second-year PTA students from Madison College.

Session Description

Development. Development of this educational intervention involved several steps. Several years ago, instructors from the local PTA program visited the PT school and provided a lecture about the PTA program to PT students. In the next course iteration, instructors from the UW-Madison and Madison College PTA program collaborated to develop key session components including the session structure, objectives for the PT and PTA students, lecture content and guiding questions to facilitate interactive collaborative discussions. The current pilot intervention included PT and PTA students attending one face-to-face session in a classroom setting in which small groups, consisting of students from each program, interacted. Session objectives included the following: to introduce PT students and PTA students to each other; describe educational requirements of PTs and PTAs; and to describe appropriate roles/responsibilities of PTAs.

Intervention. Table 1 provides details of the educational intervention. Curricular elements included pre-class activities and face-to-face interactions—a blended learning approach (American Physical Therapy Association, 2012, 2013; Wisconsin Department of Safety and Professional Services. <https://dsps.wi.gov/Pages/Professions/PT/Default.aspx>. Accessed April 4). The face-to-face session consisted of small groups of PT and PTA students who were assigned one of three cases to review. Instructors, who have a history of facilitating small group interactions together, had at least one PTA student with a group of PT students as the PTA program consisted of only 20 students. Course instructors facilitated a large group discussion after the small groups discussed the assigned case.

Allotted Time (minutes)	Activity
Pre-Activity	*Pre-session readings consisting of WI state statutes, APTA position papers, and Medicare regulations regarding student supervision; students complete RIPLS tool and quiz (pre-intervention)
15	Forming groups with at least one PTA student in each group and collection of completed RIPLS
5	Overview of the session
5	Quiz-completed individually
45	Review of case in group followed by discussion of each case via small group discussion with reports back to the whole group
10	PT and PTA students individually complete RIPLs and quiz again with large group discussion to address any unanswered questions regarding the quiz
5	Closure

Table 1. *Educational Intervention*

Abbreviations: APTA, American Physical Therapy Association; RIPLS, Readiness for Interprofessional Learning Survey; WI, Wisconsin

*American Physical Therapy Association. (2012); American Physical Therapy Association. (2013). Wisconsin Department of Safety and Professional Services.

Analysis of Activity

We used a pre-post quiz consisting of 6 true/false questions to assess knowledge about state regulations and license requirements (Table 2). The primary author, a PT with twenty-eight years of experience, fourteen of those in teaching, developed the quiz. Quizzes were scored as the sum of correct answers with 6 representing a perfect score (all correct answers) using a Mann-Whitney-Wilcoxon test.

We administered the Readiness for Interprofessional Learning Survey (RIPLS) pre-and post-session to measure attitudes and beliefs about PTs and PTAs and,

within one-to-two weeks, collected anonymous post-session feedback via an electronic survey from the PT and PTA students regarding the intervention.

The RIPLS (Appendix A) is a 19-item questionnaire examining attitudes and beliefs of students in differing healthcare professional programs (Parsell & Bligh, 1999). Sub-domain categories for RIPLS include: “Teamwork and collaboration,” “Negative professional identity,” “Positive professional identity,” and “Roles and responsibilities.” Subcategories serve as a proxy reflecting greater appreciation and more positive attitudes for others’ roles. Students answered each question of the RIPLS questionnaire based on a 5-point

True or False	Statement, if false change the language to make it true
False	A licensed PTA can practice in the clinic without a licensed PT onsite for an unlimited amount of time.
True	A PT can delegate a PTA to perform joint mobilizations.
True	A PT is able to use data gathered by a PTA using standardized assessment tools as part of the data included in an evaluation.
False	A PTA is legally able to modify STG, LTG, and the POC; including interventions.
False	A PTA cannot act as a clinical instructor for a PTA student.
True	A PTA can see a patient for their final, discharge visit.

Table 2. *PT/PTA Quiz Questions*

Likert Scale from “Strongly disagree” to “Strongly agree.” While the RIPLS has primarily been validated and adapted for use in interprofessional context, we chose to use it in this intraprofessional context for two reasons (Yu, Jowsey, & Henning, 2018). First, it has already been used in the PT literature relative to intraprofessional educational intervention (Brooks & Gorman, 2017). Second, we were not aware of a tool that directly measures intraprofessional education assessment in PT. Work of Jelley, et al., (Jelley, Larocque, & Borghese, 2013) provides information relative to essential competencies of intraprofessional education yet does not provide a tool to measure these competencies.

Cronbach’s alpha for the current pre-session RIPLS questionnaire was 0.90 with a 95% confidence interval of 0.87-0.94, indicating an excellent degree of internal consistency. Reverse scoring of items was performed as appropriate so 5 represented the most desirable answer and one was least desirable. We calculated an overall composite RIPLS mean score by the mean of coded answers. Composite scores of each sub-domain (“Negative professional identity”, “Positive professional identity”, “Roles and responsibilities”, and “Teamwork and collaboration”) were similarly calculated by the mean coded score of questions within that domain.

Since course feedback was anonymous, we aggregated students’ pre-post session scores. Surveys with missing time point (pre- or post-session) or role (PT or PTA student) information were excluded from analysis. The remaining scores were grouped by time and role. Scores between roles were compared at each time point and score improvement was tested for each role. Summary statistics (mean (sd) and median [IQR]) for each domain were calculated. Mann-Whitney-Wilcoxon tests were used to determine differences at a 0.05 significance level. Analysis was conducted using R version 3.5.1.

Results

Forty second-year PT students and 20 second-year PTA students participated in the educational session; 20 PT and 14 PTA students identified as female. Mean age of PT students was 27.73 years (range 24-38 years) and mean age of PTA students was 29.58 years (range 21-46 years).

Quiz grades significantly improved for *both* PT and PTA students from pre- to post-test. PT students’ scores

increased from 4.32 (sd 1.07) to 5.21 (0.55) and PTA students’ scores increased from 4.47 (1.12) to 5.29 (0.59). PT and PTA students performed similarly at both pre-session ($p = 0.61$) and post-session ($p = 0.61$).

One hundred and thirteen RIPLS surveys were submitted, nine were removed due to missing role information and one due to missing time point. For participants with incomplete RIPLS, sub-domain scores were calculated when possible (Table 3). PTA students had significantly higher scores than PT students at pre and post tests for the overall RIPLS, “Teamwork and collaboration,” “Negative professional identity,” and “Positive professional identity” sub-domains (Table 4). PT and PTA students scored similarly for the Roles and responsibilities sub-domain at pre and at post-session. PT students’ “Teamwork and collaboration” scores significantly improved between pre and post-session surveys. The overall RIPLS score and “Teamwork and collaboration,” “Negative professional identity,” and “Positive professional identity” sub-domains did not improve for either PT or PTA students.

Thirty-three PTs and 17 PTAs responded to the post-course survey (Table 5). Most students agreed or strongly agreed that they could describe the roles of the PT/PTA, that the session objectives were met, and that they could defend decisions regarding the PT or PTA in clinic. In addition, 81% of PT and PTA students agreed or strongly agreed that instructors should continue to offer this session and 71% agreed or strongly agreed that instructors delivered the session in a logical manner and helped them learn.

Students had the option to respond to three open-ended questions: “Please share areas of improvement for this educational session,” “Please share what you liked best about this educational session,” and “Please provide any additional comments/suggestions for future sessions.” PT and PTA students responded with a variety of comments including a desire to have more time to talk with each other informally. PT students also wanted additional information about PTA roles and responsibilities in clinical care and PTA educational requirements. PT students would have preferred to collaborate with PTA students earlier in the PT curriculum as this session occurred in the spring semester of the PT students second year in the program. One PTA student suggested offering an entire course on the PT and PTA relationship.

Timepoint	Role	Median [IQR]	Mean (sd)	Missing
Negative professional identity				
Pre	PT	13 [12 to 14]	12.79 (1.41)	0
	PTA	15 [14 to 15]	14.42 (1.12)	0
Post	PT	13 [12 to 14]	13 (1.2)	0
	PTA	14 [13 to 15]	14.06 (1.09)	0
Positive professional identity				
Pre	PT	21.5 [20 to 23]	21.44 (2.78)	0
	PTA	25 [24 to 25]	23.94 (2.34)	1
Post	PT	23 [21 to 24]	22.44 (2.21)	1
	PTA	25 [23.75 to 25]	24.12 (1.59)	1
Roles and responsibilities				
Pre	PT	8 [7 to 8]	7.55 (1.23)	1
	PTA	7 [6 to 8.5]	7.16 (1.74)	0
Post	PT	7 [7 to 8]	7.48 (1.23)	0
	PTA	8 [8 to 8]	7.88 (1.27)	0
Teamwork and collaboration				
Pre	PT	42.5 [39 to 44]	41.26 (3.4)	0
	PTA	45 [43 to 45]	43.74 (2)	0
Post	PT	44 [43 to 45]	42.97 (2.82)	0
	PTA	45 [44 to 45]	44.41 (0.87)	0
Overall RIPLS				
Pre	PT	85 [79 to 88]	82.79 (6.97)	1
	PTA	91 [88.25 to 93]	89.5 (5.36)	1
Post	PT	88 [83.75 to 90]	85.75 (5.55)	1
	PTA	91 [89.75 to 93]	90.56 (3.651)	1

Table 3. Summary statistics of PT and PTA RIPLS scores. Thirty-four PTs and 19 PTAs responded to the pre-course survey; 33 PTs and 17 PTAs responded to the post-course survey. Some components of the survey were incomplete and marked as missing.

RIPLS sub-domains	Between PTs and PTAs		Between pre- and post-session	
	Pre	Post	PT	PTA
Negative professional identity	< 0.001	0.005	0.557	0.199
Positive professional identity	< 0.001	0.003	0.150	0.808
Roles and responsibilities	0.532	0.254	0.648	0.277
Teamwork and collaboration	0.002	0.045	0.013	0.605
Overall RIPLS	< 0.001	0.001	0.072	0.755

Table 4. P-value Results* from Mann-Whitney-Wilcoxon Tests for Differences of RIPLS between Student Groups and Timepoints

*Significant differences are highlighted in bold

Please indicate to what extent you agree with the following statements.

	Strongly disagree - Somewhat Disagree	Somewhat Agree -Strongly Agree
The objective of stating roles of PT/PTA students was met.	12.91%	87.1%
The objective of stating roles of PT/PTA students was met.**	9.68%	87.1%
The objective of being able to defend decisions regarding PT/PTA clinic responsibilities was met.	9.68%	90.31%
This experience should continue to be offered.	9.68%	90.33%
The format of this session was logical and helped me learn.	16.13%	83.87%

Table 5. *PT and PTA Student* Feedback Post-Educational Intervention*

*53.38% identified as a PT student and 20.63% as a PTA student

**3.23% neither agreed or disagreed with being able to state PT/PTA roles

PT and PTA students perceived this session to be beneficial in better understanding each other's roles. Students indicated they "loved that we could sit down and learn about other", "I loved problem solving with the PTA students and learning how they fit in the clinic setting, overall this session was a great collaboration." Finally, students suggested logistic improvements such as placing case information on a projector during discussion and assuring even distribution of PTA students in the small groups with PT students.

Discussion

This pilot, cased-based, blended educational intervention met our objectives of increasing students' knowledge about state regulatory and supervisory requirements of PTs relative to PTAs, improving overall appreciation of each group of students while building positive relationships, and fostering a greater understanding of PT and PTA educational requirements. These findings are important for two reasons. First, the creation of a space to develop positive relationships sets the stage for improved professional clinical collaborations. Intraprofessional education closely parallels interprofessional education and interprofessional education has been shown to prepare students for improved collaborative clinical care, leading to improve patient outcomes.(Barr, Koppel, Reeves, Hammick, & Freeth, 2008) Second, students from other professions learn best when they are able to learn from, with, and about other health profession students (Interprofessional Education Collaborative (IPEC), 2016). These

assumptions likely transfer to intraprofessional education, specifically where PTs can better understand the full scope of the care PTAs can provide through collaborative sessions.

With respect to gaining a better appreciation of each other, in this pilot study, PT students demonstrated more growth than PTA students in their attitudes toward "Teamwork and collaboration" as assessed by the RIPLS. However, no significant improvement occurred either within or between groups or in any other subdomain scale. Higher "Negative professional identity" and "Positive professional identity" scores for PTA vs. PT students suggest that PTA students likely have a better understanding of the degree of collaboration realized in their assistant role. PTA students are trained with an expectation of working with a variety of PTs, yet PT education promotes "autonomous" practice which can potentially lead to less collaborative practice with PTAs. In order to improve collaborative care, PTs may benefit more from early and active engagement with PTAs.

Our findings are similar to the work of Brooks (Brooks SV, 2017), who also found the most significant changes were in the "team and teamwork" for PT students. Student-perceived benefit of our session was also evident because post-session comments requested earlier, more frequent opportunities to collaborate; this finding was consistent with previous investigations of more resource-intensive interventions (Hawthorne et al., 2017).

Past research on intraprofessional training demonstrated improved relationships and understanding of roles and responsibilities with longer in-person interventions (Plack et al., 2006). Yet, longer duration educational sessions are not always viable given constraints of time, distance, and resources. This pilot education intervention provides a way to bring health profession students together that requires few human and material resources in order to improve PT and PTA students understanding of roles, responsibilities, and education requirements.

An understanding of ways to bring students together that maximizes collaborative learning in a time when human and curriculum constraints exist is important in contributing to collaborative clinical practices. While virtual intraprofessional collaboration is possible, we developed this single in-person educational intervention using a blended format as a way to initiate collaborative relationships. The work of Edgoose and Edgoose (Edgoose & Edgoose, 2017) highlights the benefits of face-to-face interactions between physicians and patients and postulates that face-to-face interactions are more than being in the same room together. Yet, we also recognize that the best method for delivering profession-specific intraprofessional interventions is unknown (Reeves, Pelone, Harrison, Goldman, & Zwarenstein, 2017; Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013).

Instructors need to reconsider not only the benefits of blended learning (where pre-session work sets the stage for face-to-face learning) but also creating online learning experiences fostering positive relationships within and amongst professions. Attention to factors within the instructor's control that assist in creating positive relationships online should be considered. For effective online community and relationship building, instructors should consider four broad categories; course structure, methods of feedback, facilitating discourse and effective facilitation strategies (York & Richardson, 2012).

Limitations

A limitation of this education intervention was the small convenience sample of PT and PTA students and single-center design, which limits generalizability; however, the sample was large enough to detect differences between pre- and post-intervention knowledge

scores. No sample size calculation was conducted prior to recruitment for this study as the sample size was limited to classroom size and we were unable to not pair pre-post data for analysis as all data was anonymous.

Additionally, we did not assess whether knowledge changes endure and whether changes transfer to the clinical environment. This is consistent with the intended scope of this pilot project and will be addressed in future longitudinal projects that extend this work from Levels 1 (reaction) and 2 (learning) of Kirkpatrick's Four-Level Training Evaluation Model to Levels 3 and 4 in which behavior change and influence on patient care is measured (MindTools, n.d.). The inability to correlate individual scores across time is also a limitation, reducing generalizability.

We considered limitations specific to the RIPLS tool before including this measure such as commentary noting that "scores proved stubbornly insensitive to course improvements and to pre-post change" and that the RIPLS has unstable reliability estimates in the subscales. (Schmitz C & Brand B, 2020) However, after considering other tools, we selected the RIPLS as most congruent to our work. It is likely that the usefulness of the tool would improve with a more intensive intervention and larger numbers of students.

Conclusion

We learned that a single education intervention can lead to a change in knowledge, attitudes and beliefs by PT students, specifically with regard to the RIPLS subdomain of roles and responsibilities relating to PTA students. This is important as PTAs cannot work within their scope of care without supervision by a PT. PTs may limit delegation of tasks and constrain patient care if they do not understand the full working capacity of a PTA thus falling short of meeting the Quadruple Aim (Institute of Healthcare Improvement, 2019).

Both groups of students enjoyed this experience and wanted more time to connect and talk with each other. They learned not only from structured teaching but also from free time to talk and learn about the individual, their experiences, and what led them to their respective professional program. Strengths include ease of intervention reproduction, brevity, and high satisfaction.

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