Title
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An examination of beliefs, attitudes and behaviors of physical therapy students toward interprofessional experiences in the clinical education setting: a mixed method study

by

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ABSTRACT

Background: Interprofessional education is required to develop entry-level doctorate physical therapists who are immediately ready for collaborative practice and who can deliver quality, patient-centered care. Insight into student perceptions of interprofessional experiences in clinical settings will inform pedagogical strategies for classroom/clinical education and assist in the application of core competencies. This convergent parallel mixed-method study explored the behaviors, beliefs and attitudes of first year physical therapy students toward interprofessional experiences during clinical clerkships. **Methods/Methodology:** Using the Interprofessional Socializing and Valuing Scale (ISVS) (n=33), we measured the degree to which transformative learning took place following an 8-week clinical rotation, as evidenced by self-report changed behaviors, beliefs and attitudes. After subjects completed their clinical rotation in either an acute care or outpatient facility, we conducted semi-structured interviews (n=26). We used a general inductive approach and thematic content analysis to understand students' perceptions of learning outcomes and impact of interprofessional experiences in the clinical setting. **Results:** A repeated measures ANOVA showed no statistical differences ($p<0.05$) between pre- and post-test scores within or between groups using the ISVS scale. However, thematic content analysis of the qualitative data revealed that

learners perceived interprofessional experiences to be beneficial in helping them understand the importance of: establishing trusting relationships, developing practice reflexivity and good communication. Additionally students reported that these learning outcomes assisted them in: developing their professional identity, understanding the "whole" patient and recognizing the need for referral practice. The context and nature of the interprofessional experiences can be categorized as four forms of interprofessional work (networking, coordination, collaboration and team-based work). **Conclusions:** Acute care clinical settings offered the most diverse and frequent opportunities for interprofessional experiences. Understanding the four forms of interprofessional work as described by students during their clinical clerkships, may assist students' in recognizing and valuing interprofessional experiences. Additionally faculty development around the forms of IP work may assist in the creation of learning objectives and assessment tools for a more evidenced-based clinical education framework within physical therapy.

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INTRODUCTION

> "…No physician, no physical therapist should have the entire responsibility for one patient. The patient's care is more precious than that, so it makes me feel really good to have interprofessional collaboration. It's necessary. It increases the quality of care…a patient's care is much more precious than any one person should be responsible for, or should be allowed to be responsible for." (Female first year student in doctor of physical therapy program, participating in hospital-based outpatient clinical education.)

Creating a healthcare delivery system that is focused on patient-centered outcomes and is efficient, effective and safe requires interprofessional collaboration (IPC). The call for increased interprofessional collaboration stems from many factors such as medical error rates in hospitals (Institute of Medicine, 2003), a need for improved patient outcomes and rising annual healthcare costs in the United States, approaching 2.3 trillion dollars (Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics). Contributing to these costs are improved treatments that prolong life and support living with chronic disease (Chronic Disease Overview, Reeves et al, 2008), Medicare healthcare costs for an aging population (Orzag 2008, Reeves et al, 2008) and new, sophisticated technology (Centers for Medicare and Medicaid Services). In addition, nearly 32 million people may be added to the 'insured pool' following the recent passage of the Patient Protection and Affordable Care Act (Healthreform.gov). Interprofessional collaboration and team based care may 1) provide additional points of entry into the healthcare system 2) reduce the impact of workforce shortages, and 3) improve care for complex, chronic

needs such as diabetes, geriatric and palliative care (Baldwin, DC 2007). Specific patient outcomes associated with interprofessional collaboration include decreased hospitalization rates and emergency department visits, improved prescription adherence, increased patient satisfaction, decreased mortality rates and increased functional status of patients (Baldwin DC 2007; Barker et al., 1985; Rubenstein et al., 1984; Zimmer et al., 1985).

Interprofessional collaboration requires that future health professionals receive education on how to be effective collaborators. Recent literature reports that interprofessional education content in both didactic and clinical education improves patient-centered outcomes (Buring et al., 2009, Hammick et al., 2009, World Health Organization, 2010, Reeves et al., 2013). Therefore, health professionals, medical educators, and educational curriculum developers are heeding the call for interprofessional collaboration and embracing the need for further research in evidence-based, interprofessional education, as well as interprofessional experiential learning in clinical practice.

Key Definitions

The United Kingdom Centre for Advancement of Interprofessional Education (CAIPE) describes interprofessional education as occurring *"when two or more professions learn with, from and about one another to improve collaboration and the quality of care"* (CAIPE 1997, 2002). Collaborative interprofessional education is a core educational requirement cited by the Institute of Medicine Health Professions Education Report (2003) (Reese et al., 2010, IOM 2003). Additionally, the World Health

Organization 1988 Report (Roderhorst et al., 2005, Hammick et al., 2007) and the WHO Framework for Action (2010) states:

> "After almost 50 years of inquiry, there is now sufficient evidence to indicate that interprofessional education enables effective collaborative practice which in turn optimizes health-services, strengthens health systems and improves health outcomes. In both acute and primary care settings, patients report higher levels of satisfaction, better acceptance of care and improved health outcomes following treatment by a collaborative team."

Interprofessional collaboration is defined as *an active relationship between two or more health or social care professionals who work together to solve problems or provide services* (Barr et al., 2005). Further, D'Amour et al., (2005) suggests that interprofessional collaboration consists of two constructs: 1) collective action that addresses the complexity of client needs; and 2) a team life that integrates the perspectives of each professional and in which team members respect and trust each other and work together to solve problems. Common to both definitions is the importance of the patient needs. Bridging the definition between interprofessional education and interprofessional collaboration is the process of interprofessional learning. In this manuscript, the process of interprofessional learning includes Nisbit et al.'s (2013) definition of learning in the workplace, as *"the process of developing knowledge, skills or new insights, bringing about a change in understanding, perspective, or the way something is done or acted upon"* as a result of two or more professionals working together.

Interprofessional education initiatives

If interprofessional education and learning enable effective collaborative practice, physical therapy curricula must incorporate interprofessional educational initiatives upon the start of the professional school curriculum. Literature reports that interprofessional education initiatives primarily focus on formal, structured and explicit educational initiatives that occur mainly in structured classroom activities, small group settings, standardized patient exercises and post-licensure initiatives (Nisbit 2013, Reeves et al., 2010). Educational initiatives appear to be most effective when students are actively engaged, collaborating and learning from one another or other professionals versus learning side by side (Wamsley et al., 2012, Hammick et al., 2009, Oansadan & Reeves, 2005, Freeth & Reeves, 2004). Additionally these educational initiatives are more effective when students are involved in realistic scenarios that reflect the professional roles of the participants (Reese et al., 2010, Oandasan & Reeves, 2005, Kilminster et al., 2004). Since realistic professional roles occur naturally in the clinical setting, clinical education would seem an ideal place for interprofessional education. But there are significant logistical challenges in providing interprofessional education in the clinical setting (Cook et al., 2001). Unfortunately, not all clinics value interprofessional education equally, or have the same opportunities for collaboration, and published data on interprofessional education in this environment is lacking.

Theoretical lens

Since clinical education is the arena in which students apply knowledge, practice skills, and develop professional values / identity through authentic patient care experiences, I chose a sociocultural theoretical lens to frame my study. Transparency of

my own worldviews is essential for a robust qualitative research study; I share a similar opinion to Etienne Wenger, a social learning theorist. Wenger posits that learning is a social process and occurs through participation in communities of practice (1998). Lave and Wenger (1991) define communities of practice as a "set of relations among persons, activity and world, over time and in relation with other tangential and overlapping communities of practice". Wenger (1998) reports that learning occurs when people participate in the practices of social communities and construct identities in relation to them. Specifically, literature reports that workplace learning involves accessing knowledge that is distributed across professions, artifacts, and complex situations, and also that learning occurs between time and space in a complex environment with complex relationships (Wenger, 1998, Bleakly et al., 2006 and Dornan et al., 2007). Clinical education settings are complicated and a substantial amount of informal and implicit education occurs in these settings (Nisbit et al., 2013, Wagter et al., 2012, Mook et al., 2010, Marsick, 2006, Matthews & Candy 1999). This complexity may make it difficult for students to recognize or value interprofessional education opportunities. However with guided interview questions and time for student reflection, this study aimed to illuminate the students' reports of interprofessional experiences and learning that occurred in the clinical clerkships while they attempted to navigate the complexities inherent in these communities of practice.

Authenticity in interprofessional education

Interprofessional education in authentic clinical settings promotes interprofessional collaboration and teamwork skills through frequent opportunities for interprofessional interaction (e.g. Jacobsen et al., 2009, Robson & Kitchen, 2007, Hylin

et al., 2007, Ponzer et al., 2004, Reeves et al., 2002, Reeves & Freeth, 2002, Fallsberg & Hammar 2000;). Specifically both Jacobsen et al. and Ponzer et al. completed a two-week interprofessional training program in orthopedic clinical education wards in Denmark. Interprofessional student teams consisting of physiotherapy, occupational therapy, medicine and nursing undergraduate students worked together for a period of two weeks to care for patients on orthopedic floors in regional hospitals in Denmark. Results from both studies reported improved knowledge regarding other professions (Ponzer et al., 2004); learning about interprofessional teamwork (Jacobsen et al., 2009); gaining better understanding and strengthening of their own professional roles and learning to work together to benefit the patient (Jacobsen et al., 2009 and Ponzer et al., 2004). Since clinical education experiences may offer physical therapist students authentic interprofessional education opportunities, it is logical to embed interprofessional education initiatives in the clinical clerkships.

Possible barriers to embedding interprofessional education in clinical education experiences include lack of explicit direction by the professional organization. Additionally, the physical therapy profession's clinical education clerkship model is varied and inconsistent (Strohschein et al., 2002, Black et al., 2010). The Commission on Accreditation in Physical Therapy Education does not explicitly mandate that clerkships occur in specific clinical settings, such as acute care, pediatrics, and/or outpatient settings. Often, the director of clinical education makes this determination based on student needs and clerkship site availability. With the difficulty of placing large numbers of students in clinical settings within a local region, assigning students to

pre-determined learning environments for the course of their clinical education is challenging.

Limited evidence exists as to the types of physical therapy clinical settings that offer the rich, contextual interprofessional experiences required for optimal learning of interprofessional collaboration. Two recent studies in the physical therapy literature reinforce the contention that interprofessional learning and collaborative experiences in the clinical setting are a necessary component of physical therapist education. Black and colleagues observed novice physical therapists in their first year of practice and concluded that there is a "dynamic interaction between learning and developmental change that occurs in the individual in the community of practice (2010)". In a Canadian study that surveyed 397 occupational therapists and 368 physical therapists, 97% of the therapists in both public and private practice found interprofessional education to be important for effective clinical practice (Mueller et al., 2008). When these same therapists were given a choice of when and where to complete their interprofessional education, 65% of therapists chose clinical placements and 26% chose classroom settings (Mueller et al., 2008).

American Physical Therapy Association call to action

The physical therapy profession must educate and develop flexible, adaptable entry-level physical therapists that are immediately ready for collaborative practice and able to deliver quality, patient-centered care. In 2009, the Physical Therapy and Society Summit meeting reframed the current physical therapy care paradigm from a traditional focus on the physical therapist and the patient (a 1:1 relationship) to one in which physical therapists are an integral part of a collaborative, interprofessional health care

team with the health care consumer as its focus (Kigin et al., 2010). The American Physical Therapy Association states that for physical therapists to be effective and thrive in the collaborative health care environment of the future, this paradigm shift is required (Kigin et al., 2010). To provide high quality and safe patient care, as well as improved patient outcomes, new team-based models are being introduced including Patient Centered Medical Home Models and Accountable Care Organizations. Both models will require a team of healthcare providers to care for a panel of patients and can be part of various healthcare settings, such as acute care, ambulatory care, outpatient and/or primary care settings, etc. For physical therapists to be successful and valued team members of these proposed healthcare delivery models, the physical therapy profession should prioritize the implementation of interprofessional education and learning opportunities for our current and future practitioners. But to do so, the first requisite step is for the physical therapy profession to assess the current interprofessional practices in the clinical education settings. One way to do this would be to inquire into entry-level doctorate student interprofessional experiences in the various clinical settings in which they participate. The nature and context of interprofessional education and learning experiences as well as their perceived learning outcomes could be explored.

Study purpose and aims:

The purpose of my study is to address a gap in the physical therapy literature by examining the interprofessional education opportunities within the diverse clinical settings which students complete their clinical clerkships (outpatient private practice, outpatient hospital based private practice, inpatient acute care, and skilled nursing

facility) from the perspective of entry-level physical therapy students. The three aims of my study were:

- To measure the change in scores (before and after clinical placement) in beliefs, attitudes and behaviors associated with interprofessional collaboration.
- To compare interprofessional collaboration experiences of physical therapy students in differing clinical placements, including inpatient and outpatient clinical settings.
- To describe the breadth of perceived learning outcomes that occurred during interprofessional education within these clinical experiences.

Since I chose research participants who were first year entry level students who had yet to take part in a full-time physical therapy clinical clerkship, I felt that these students might not yet recognize the interprofessional learning opportunities that arise in clinical practice. Therefore, my hypothesis for the first aim were that there would be no difference in mean change scores (pre-post test) for the three domains associated with the interprofessional experiences, beliefs, behaviors and attitudes after students completed an eight week clinical rotation, and no difference between inpatient, outpatient or control groups. The second two aims were addressed qualitatively.

This study may facilitate incorporation of interprofessional curricular content into physical therapy clinical education to help prepare students to deliver high quality and effective patient-centered collaborative care. Understanding what interprofessional experiences the students are reporting in the authentic clinical settings may provide direction to both academic and clinical faculty to help establish interprofessional learning opportunities for a more uniform and evidenced-based physical therapy clinical

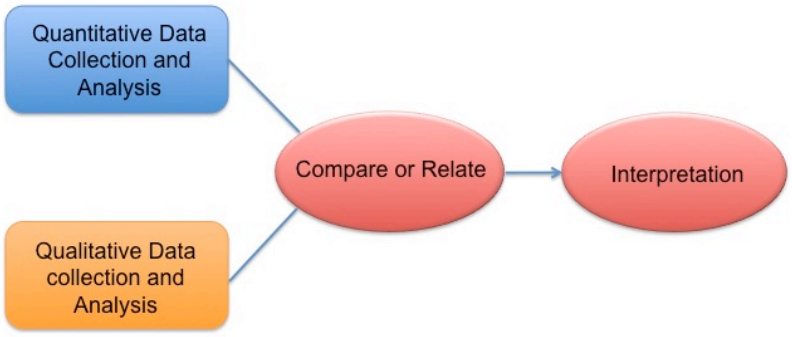
education framework. Additionally these results may help to guide the creation of authentic interprofessional educational opportunities both in the classroom and clinical settings.

METHODOLOGY

Study Design

A convergent parallel mixed method design as described by Creswell (2014) was used in this study (figure 1). This design was chosen to combine data for a comprehensive understanding of interprofessional experiences that may occur during an eight-week clinical clerkship. The convergent parallel mixed method design allowed the collection of quantitative and qualitative data simultaneously and was followed by comparison of the findings in an overall interpretation.

Figure 1 Convergent Parallel Mixed Method Design



Creswell, JW 4th Edition, 2014

METHODS

Recruitment

Recruitment of research participants (first year entry level doctoral physical therapy students) occurred via email invitation to one entire cohort of 34 students in one professional program. This invitation invited participants to take part in both the quantitative and qualitative portion of this study. I sent out invitations approximately two weeks prior to the students leaving on their first full-time, eight-week clinical clerkship. The inclusion criteria were that the students had completed their first year classroom curriculum in good academic standing enabling them to advance to their first clinical clerkship. Additionally they were required to have completed the yearlong longitudinal interprofessional education curriculum that was part of their program requirements at the University of California, San Francisco (UCSF). This curriculum introduced students to the basic concepts of team-based practice with a primary objective of bringing students from the different health professions together to introduce the learners to different roles and responsibilities found within the health care team. Face-to-face interaction was limited to two half-days of large and small group discussion, and participation in a longitudinal team based project. Because of the small number of students in this first-year class, all volunteers were accepted into the study as long as they met inclusion criteria. No additional exclusion criteria were applied.

Study Sample

This was a convenience sample. Thirty-three students agreed to take part in the study. Of the 33 students who completed the self-report survey both pre and post clinical clerkship, 26 completed a one-to-one interview. The seven students who

dropped out the interview portion cited competing priorities and scheduling challenges. Each research participant had their clinical clerkship location pre-selected for them by the academic coordinator of clinical education and so I chose to study all the clinical settings assigned. For analysis purposes I categorized locations into three setting types: inpatient (including acute care and skilled nursing facility) and outpatient hospital-based clinics and outpatient private practice settings. Specifically the outpatient settings were divided into two separate categories based on my pre-existing work experience in these multiple settings.

Quantitative Data Collection and Analysis

The quantitative data collection portion of this study used the Individual Socialization and Valuing Scale (ISVS) (n=33), developed by King et al. (2010). This self-report survey has 24-items, with, Likert scale responses (0-7 scale). The ISVS can be used to evaluate the beliefs, behaviors and attitudes that underlie interprofessional socialization and collaborative practice in health care settings and captures the socio-cultural aspect of interprofessional collaboration in the workplace (including social interactions, relationships, and behaviors). For example, in the attitude domain one-item states “I have gained an enhanced awareness of the roles of other professionals on a team.” A “0” suggests the item was not applicable to the respondent and 7 indicates that the respondent believes this item is correct to a “very great extent”. The internal consistency of the tool was reported as excellent overall (Cronbach’s alpha = .90) and moderate to excellent for the three separate subscales: Self-perceived ability to work with others (beliefs alpha=. 89), value in working with others (attitudes alpha=. 82) and comfort in working with others (behaviors alpha=. 79) (King et al., 2010). Although

technically an ordinal scale, literature has reported its properties as if the scores had ratio scaling.

In this quasi-experimental pre/post test design (clinical clerkship was the intervention), the ISVS was administered after students finished their first academic year curriculum, before students left for their first eight-week clinical clerkship (n=33). The ISVS was administered again within two weeks of the students returning from their eight-week clinical clerkships (n=33) (figure 2). Nine participants were in the inpatient setting, either acute care or skilled nursing facilities. Twenty-four participants worked in the outpatient settings, either hospital-based outpatient or private practice clinical settings. A sample size of 27-34 participants was deemed sufficient (for noting statistical significance) and determined *a priori*, based on power calculation using power of .70 and .80 and an alpha of 0.05 and effect size ranging from 0.50-0.70 (standard deviation units). Since there is no published responsiveness data for the ISVS with which to generate approximate effect size, I guessed. Therefore, I deemed a change as small as 0.5 point to as large as 0.7 point will be significant for calculation of the effect size. My sample size for my intervention group (clinical clerkship) was 33 participants.

To create a more robust study design, a control group was also used. This control group consisted of first year entry-level doctoral physical therapy students in the same graduate division program at UCSF/SFSU except that they started their program one year after that of the intervention group. The same process was used to invite the participants to the research study and same inclusion and exclusion criteria were used. The control group consisted of 17 students. I administered the ISVS eight weeks prior to finishing their first year coursework, but after they had completed their longitudinal

interprofessional education curriculum. The second ISVS was administered eight weeks later prior to advancing to their first eight-week clinical clerkship (figure 3).

Statistical analysis was conducted using a repeated measure ANOVA with statistical significance determined using a $p \leq 0.05$ for all primary analyses a priori. A within-group analysis was determined by calculating the mean change scores across time (pre-post test). A between-group analysis was determined by calculating the mean change scores across time between the outpatient, inpatient and control group.

Figure 2 Data Collection (Intervention)

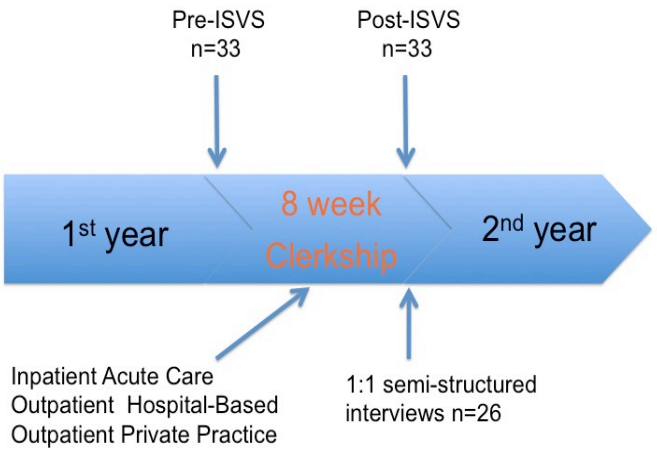
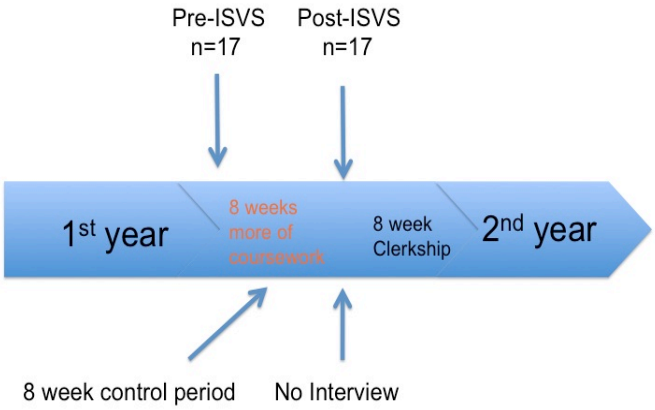


Figure 3 Data Collection (Control)



Qualitative Data Collection and Analysis

The second part of the convergent parallel design was a qualitative inquiry using a general inductive approach with thematic content analysis of interviews conducted with participants (n=26) after they completed their first eight-week clinical clerkship in either an inpatient (n=7) or an outpatient setting (n=19). The qualitative data collection involved in-depth one-on-one, semi-structured interviews that were completed after the eight-week clerkship. A general inductive approach described by Thomas (2006) was

utilized in this study, as it is a systematic way to analyze qualitative data. Thomas defines inductive analysis as the process in which concepts, models or themes are generated from the detailed readings of text and interpretations are made from the raw data by the researcher. The goal of this project was exploratory in nature and not designed to generate interprofessional education theory. An iterative process of coding, categorizing, and analyzing participants' comments was used to identify dominant themes.

To determine the necessary number of research participants that was needed for an adequate sampling for the qualitative portion—I used the concept of data saturation (Creswell, 2014), in which researchers may confidently stop collecting data when interviews no longer generate new insights or perspectives nor reveal new themes. The sample size of 26 students was more than adequate for this approach since the students were mainly participating in one of two different clinical clerkships (inpatient vs. outpatient). Additionally the majority of the research participants were placed in an outpatient setting and data saturation was confidently reached after approximately 10 interviews (conducted a total of 19). I conducted a total of seven interviews of research participants who completed their clerkships in the inpatient setting.

Each student volunteer participated in a 60-minute one-on-one interview within one month of finishing his or her 8-week clerkship. Semi-structured interviews were conducted with first year physical therapy students to determine what specific experiences in their clinical education clerkship participants they considered were interprofessional learning opportunities. An interview guide was developed and questions were open-ended with the goal of prompting students to reflect on and

describe relevant interprofessional experiences during their eight-week clinical clerkship. The interview guide included a critical incident technique. Robson and Kitchen (2007) used critical incident reports to study interprofessional education and learning opportunities in the acute care, community and mental health clinics (outpatient practice was notably absent in the cited study). In their study, physical therapy students were asked to critically reflect on one positive and one negative interprofessional experience they had in their clinical education. My interview guide had similar questions but included a variety of clinical education settings (both acute and outpatient settings) and had notably different inclusion criteria for the research participants. In my interview guide, study participants were asked about the various professions with which they interacted; what they learned about roles and responsibilities of other professions; the nature and context of their interprofessional education experiences; and how these experiences may have impacted their clinical education including communication skills, development of professional identity and understanding the roles and responsibilities of other healthcare professionals. The individual interview sessions were audio-recorded and transcribed. Random numbers were assigned to each audio recording to create anonymity and confidentiality to the coding process. NVivo v10 software was used to manage and process the data. Open coding and thematic content analysis were performed. Myself and another researcher initially read and created in vivo codes and then worked together to develop a coding scheme. Next we used the coding scheme on new transcripts to verify if similar text was correctly placed into similar corresponding codes. Once this was verified and completed, I coded the remainder of the transcripts. The coding scheme was then used

to identify dominant themes. Dominant themes were then described and reported.

All qualitative research analysis requires the researcher to reflect and make transparent their worldviews and prior bias (Creswell JW, 2014). My physical therapy clinical experience in a variety of settings may have contributed to deeper understanding of the contextual and workplace challenges the students potentially encountered in the clinical setting since I have worked in both acute and outpatient facilities. This may have enabled me to develop a more nuanced perspective. However, I acknowledge that this understanding could also bring biases and assumptions to the project. Another issue to address was that I was in a position senior to the research subjects since I was a teaching assistant in two of their required classes prior to this project. This power dynamic could potentially bias the student reports of their experiences to include perspectives and reflections that would attempt to satisfy me or create a more positive report of their experiences. To mitigate this concern, several criteria were used to assess rigor and trustworthiness during the coding process.

The criteria selected was based on work by Lincoln and Guba's (1985). Quantitative research is concerned with internal validity-the idea that the study measures or tests what was intended. Qualitative research has a similar concept called credibility. Credibility refers to the trustworthiness and congruency of the findings (Shenton, 2004). To establish credibility in this study, I used both a qualitative and quantitative data to provide a richer explanation and compare the data. Participant member checks and peer debriefings were used to verify and establish credibility of the researchers' interpretation of the qualitative data, as well as to challenge the researcher

and to uncover any preconceptions, biases and assumptions. To account for dependability, to confirm that findings are consistent with the data, an external auditor was consulted to provide feedback regarding both process and product of the research. A thick narrative description of the results are presented to more faithfully represent the participants viewpoints and to promote transferability (Creswell, JW 2014).

RESULTS

Quantitative Results

Table 1 shows the descriptive characteristics of the research participants. Seventy-four percent of the surveyed students were female, average age was approximately 26 years old and all participants had a minimum of a bachelor's degree. Quantitative data analysis was performed using SPSS v.21. Using a repeated measures analysis of variance, I found no statistical significance within-groups (across time-pre/post) or between-groups (outpatient/inpatient/control). The null hypotheses were not rejected. Scores in the domains of beliefs (*self perceived ability to work with others),* attitudes *(value in working with others) and behaviors (comfort in working with others)* did not change significantly from pre-post in the intervention groups (inpatient and outpatient) or the control group (see specific results in Table 2). Further exploration of the data reveals that the mean change scores (pre-post) associated with the behavior domain (self perceived ability to work with others) declined slightly from pre-test to post-test in both the inpatient and outpatient group whereas behavior showed an the overall increase in the control group. All groups had mean change scores on all three domains that started out high and ended high. Figure 4 represents ISVS survey results by domain and clinical setting.

Table 1 Demographics by clinical setting group

	Sample Size	Gender	Mean Age	Age Range	Educational Background
	(N)	(% Female)	(Years)	(Years)	(%BS/%MS/%PhD)
Control	17	76	27.3	23-35	100/0/0
Inpatient	9	67	27.1	23-47	89/11/0
Outpatient	24	75	25.7	23-34	88/8/4
Total	50	74	26.7	23-47	92/6/2

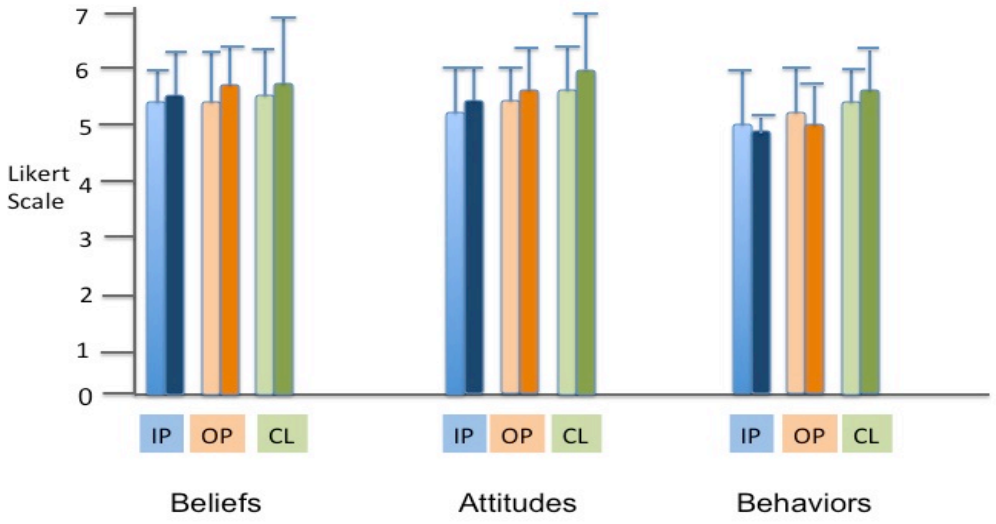
Table 2 Repeated measures ANOVA results per domain

Domain: Beliefs	**Sample Size**	**F-Test**	**P-value (0.05)**
Within group (pre-post)	**N=50**	**.957**	**.333**
Between group (inpt-outpt-control)	**N=9, N=24 N=17**	**.118**	**.889**

Domain: Behaviors	Sample Size	F-Test	P-value (0.05)
Within group (pre-post)	N=50	.117	.734
Between group (inpt-outpt-control)	N=9, N=24 N=17	.530	.592

Domain: Attitudes	Sample Size	F-Test	P-value (0.05)
Within group (pre-post)	N=50	1.076	.305
Between group (inpt-outpt-control)	N=9, N=24 N=17	.061	.940

Figure 4: Results of ISVS survey per domain



Qualitative Results

The results of the qualitative analysis provide insight into the context and nature of interprofessional experiences during the eight-week clinical clerkships in inpatient and outpatient clinical settings. The results also include key themes of the students' perceptions of their learning outcomes from these educational opportunities and the potential impact they placed on these outcomes.

Context of interprofessional experiences in clinical settings

Students described the context in which they experienced interprofessional opportunities and within the three different clinical setting categories: inpatient, hospital-based outpatient and private practice outpatient settings. The majority of students who did their clerkships in an inpatient setting reported that they experienced numerous interprofessional experiences while working on the floors of the hospital (see Figure 5).

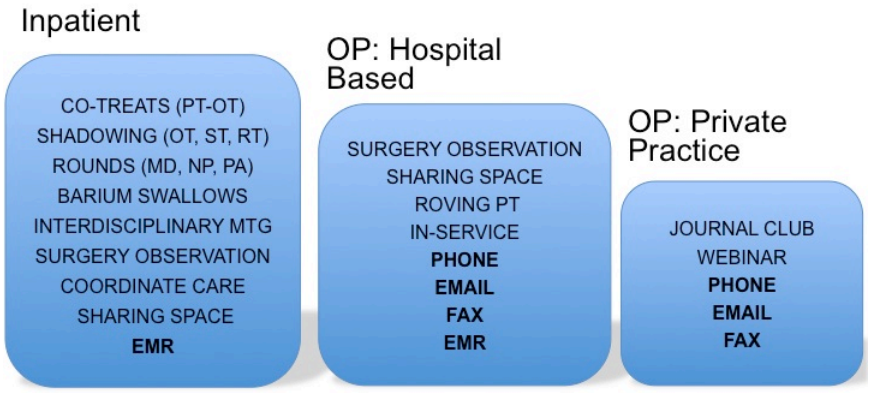
These experiences included the following examples: Co-treatments with occupational therapy; observation of barium swallows with speech therapy; orthopedic and cardiac surgery observations in the operating room; weekly interdisciplinary meetings involving case managers, social workers, nursing, occupational therapy, speech therapy, physical therapy, and nurse practitioners, rounds on the floors involving medicine, nurse practitioner, physician assistants and rehabilitation therapies; and the use of electronic medical records (EMR). While the use of EMR may seem at odds with interprofessional education, overwhelmingly the students exposed to EMR felt they were able to get a more holistic view of the patient by being able to access the perspectives and expertise of the various health professionals involved in a specific case known to the student.

Hospital-based outpatient clinics also offered a number of interprofessional experiences including one example of a “roving physical therapist” collaborating with orthopedic surgeons in outpatient office visits via an “on-call” service (see Figure 5) occurring when the physical therapist was paged. This student reported multiple instances whereby the physical therapist and the surgeon would spend time with a patient discussing their care and treatment options. Several students had opportunities to participate in observations of cardiac or orthopedic surgeries. Several in-service lectures were provided by orthopedic surgeons and presented to physical therapists updating them on surgical interventions. A couple of students reported sharing physical office, gym, and lunchroom space with other rehabilitation specialties like occupational therapists and prosthetists. Several students reported that they felt they participated in interprofessional experiences via asynchronous interactions such as use of EMR, email communication, voicemail messages and facsimile communication (see bolded words in

Figure 5). Few students reported actually speaking to a physician on the phone.

Private practice outpatient clinical settings tended to offer the most asynchronous interprofessional experiences (see bolded words in Figure 5). This setting was the most limited in regards to face-to-face interprofessional experiences with healthcare practitioners other than physical therapy. Only three students reported interacting with a healthcare professional other than a physical therapist while in the private practice setting including a massage therapist, chiropractor, prosthetist, and athletic trainer. One student reported taking part in a monthly journal club in which the referring orthopedic physicians were invited to participate; another student participated in a webinar given by an orthopedic physician. The majority of students reported that the interprofessional experiences in the private practice outpatient settings were limited to email correspondence, facsimile and brief phone calls with physicians (mainly voicemail or physician support staff).

Figure 5 Context of IP Experiences



Informal, unstructured, and unplanned

The interprofessional experiences reported by students mostly occurred informally, spontaneously and in an unstructured manner. Interprofessional experiences such as surgical observations required scheduling ahead of time, but the interprofessional interaction that occurred between the operating room staff and the student was informal, unstructured and spontaneous. These experiences tended to occur as a result of day-to-day interactions amongst staff.

Perceived learning outcomes associated with interprofessional experiences

I identified three themes related to student learning outcomes in the students' descriptions of interprofessional experiences. Students said they learned the importance of: establishing trusting relationships, developing clinical practice reflexivity and good communication.

Theme 1: Establishing Trusting Relationships

The ability to develop trusting interpersonal relationships allowed the students to feel comfortable with and to approach other healthcare professionals. It helped to build a foundation for the students to relate and to communicate with another care provider:

> *"Building trust with others makes me see them like more than just a professional. It makes me see them as a person and I can relate better to people when I know something about them. It's easier to talk to them and* see them as *someone you can approach, like when they share something with you it's like they're opening up and starting that bond."*
>
> *(Outpatient hospital based)*

"When you know somebody, you tend to respect them more, care about them more--you work closely with them and you don't want to disappoint them, you want to keep the relationship good and so you give them more thoughtful answers."

(Outpatient hospital based)

"What made an impression on me was that my CI made the effort to form a relationship with the social worker-where she knew her name and the social worker new her name-and they talked thoroughly and had really good communication. I took from that the importance of building a relationship."

(Inpatient acute care)

Students also reported that establishing trusting relationships with other healthcare professionals aided in the development of collaborative practice.

"In my perspective the best way to get collaboration is to build relationships, friendships, professional relationships, just getting to know this person as a person."

(Inpatient acute care).

And stated alternatively, a student reported:

"The person who doesn't have that personal relationship with whoever they are collaborating might not put the care into the collaboration."

(Outpatient-hospital based)

Students also reported the need to begin to establish trusting relationships while in school in order to diminish the hierarchy commonly found in the clinic settings.

"It's a good idea to start these relationships in school so that maybe when we get out into the field we are not stuck in this hierarchy type of thinking. Because that

is the way it is right now, it's hierarchical."

(Inpatient, acute care)

Theme 2: Developing practice reflexivity

Observing patient care through the multiple lenses of differing healthcare professions offered the students differing perspectives and clinically applicable skills to use when working with patients on their own and within their own scope of practice. However students reported that this required them to reflect and think about the care provided to patients by other healthcare professionals.

"I was able to learn from the other disciplines about how they managed to, how they worked with different types of patients, and then, when I actually got to go in and work with the patients, is when I learned myself what I needed to do personally to have a good outcome."

(Inpatient acute care)

"I like watching nursing or OT or Speech or whomever interacting with a patient because I find it interesting to see how someone else tries to motivate a patient, or if they are anxious—try to calm them down—that kind of thing. Because people can go about it in such different ways."

(Inpatient, skilled nursing facility)

In addition to observation, some students received direct teaching from other healthcare practitioners. Students obtained knowledge through professionals and incorporated this new knowledge into their own practice.

"Having contacted nursing prior to going into the room, I knew the patient wasn't doing great, so I approached it in a different way than I normally would have. I walked into the room with caution and gave her a little more control because

nursing had cued me a little bit."

(Inpatient acute care)

"I worked directly with the respiratory therapist and saw his goals and what he was working towards. He helped me understand how likely a patient was going to get off the trach and if they would be able to breathe on their own."

(Inpatient acute care)

Theme 3: Importance of good communication

The communication theme was frequently mentioned when the students were describing unsuccessful versus successful interprofessional experiences regardless of clinical setting. One breakdown in communication resulted in lack of follow-through between physical therapy and nursing professionals and was cited by one student as a very significant learning lesson for him.

"We could have taken care of this much better than we did… It was really a breakdown in communicating our results or findings to somebody who could really manage them, so that was too bad… it was very bad but it could have been much worse and so I was glad that she didn't end up passing away from this problem that we failed to communicate."

(Inpatient acute care)

Another student in the inpatient setting noted the difference in how she felt through verbal communication versus written communication:

"You feel a bit more thorough with verbal communication than with written documentation…if you're able to just say, "I'm concerned" versus writing down, it's different."

(Inpatient acute care).

There were numerous examples of difficulty with timely communication when students

were working in the outpatient settings and attempted to contact physicians via phone, email or fax. The lack of direct and timely communication resulted in feelings of isolation.

> *"The most interaction I had was through just reading their surgical reports and their referrals. I never actually spoke with any of them in person or anything like that. It's a private clinic and far way from the hospital, so besides phone calls and emails, it was very isolated."*
>
> *(Outpatient-hospital based)*

These students reported that when dealing with important aspects of patient care, communication needed to be timely, thorough and involve direct, verbal communication.

Impact associated with their perceived learning outcomes

After probing students about the context of the interprofessional education opportunities in which they participated, I inquired further as to the significance of the learning outcomes they identified (establishing trusting relationships, developing practice reflexivity and recognizing the importance of communication). In turn, they reported these outcomes had impact on their learning. The impact that the students reported were divided into three themes: understanding of their own professional identity within the physical therapy profession; an understanding of the "whole patient" and understanding of referral practice.

Theme 4: Professional Identity

The opportunity for physical therapy students to experientially work with other healthcare professionals allowed them to sharpen their perspective on the difference between a physical therapist and other healthcare professionals.

"My professional identity didn't go through a radical change, but as I had this experience it was definitely more sharpened and more precise of what PT is and how my skill can really benefit this patient in a different way from OT, or in a different way from the nurses, or from physicians. We have a very precise skill that we've been practicing here in school and being out in the clinic really makes it much more real."

(Inpatient, acute care)

Conversely another student did not feel that the duration of her eight-week clinical clerkship was long enough to have an impact on her professional identity when she interacted with other healthcare professionals.

"I'm not sure if interacting with other professionals in the brief time that I had so far has really helped my identity, but maybe once I get to a higher level of being able to operate as a PT and we get more detailed and defined and break things down that will maybe give me a better idea by interacting with other professionals."

(Female, inpatient, acute care)

Theme 5: Understanding the "whole" patient

Students reported that by interacting and observing the care provided by other healthcare practitioners, they began to understand the "whole patient". This involved an understanding of where the patient started and where they were going.

"In knowing everything that the patient has to go through too puts it all into a little bit more perspective for me. It was like, wow, I didn't know it was so intense."

(Outpatient, private practice)

"I really like having an interprofessional team for any given patient because I feel that you get such a better scope of knowledge and understanding about who that patient is and where they're going."

(Inpatient acute care)

Recognizing the challenges that patients go through during their continuum of care appeared to impact the student by appreciating the patient as a whole person and understanding the challenges they face—versus viewing them as their diagnosis.

"The OT was willing to not just explain things but let me watch and let me also try, which I really liked…maybe it seemed silly for me to sit there and sort a deck of cards…but watching my patient who had a stroke do it was interesting to me. It helped me understand what my patient was going through in terms of her trying to regain her abilities, sort of an aspect of it that I really wasn't tracking as a PT student."

(Inpatient, skilled nursing facility)

Theme 6: Referral practice

When students were involved in interprofessional experiences, and were exposed to the expertise, services and scopes of practice of other healthcare providers (aside from physical therapy), it allowed students to begin to get a better understanding of a patient needs. By working with other healthcare providers and having established relationships with them, the students reported feeling comfortable in asking other providers to see a patient.

"It's just making sure that you understand what this patient needs and knowing what you need to do and who you need to communicate with in order to give that patient what they need, even if it is not your responsibility to provide care, you need to make sure that you have the relationship with the rest of the healthcare

team so that you can go to them and you are comfortable with them and it's okay to go to them to be, hey, I think this patient needs you."

(Inpatient, acute care)

DISCUSSION

The key quantitative and qualitative findings from my study provided mixed results of student interprofessional experiences during an eight-week clinical clerkship. Although the survey results showed no significant changes in beliefs, attitudes and behaviors from pre to post clerkship, the qualitative findings indicated several positive learning outcomes. The main perceived learning outcomes reported by students included the importance of establishing trusting relationships, good communication and practice reflexivity. The impact they described included further development of their professional identities, understanding the "whole patient" and referral practices. Lastly, when analyzing the students' reports of the context and nature of their interprofessional learning, results determined that acute care offered the most frequent, diverse and synchronous opportunities for interprofessional experiences while the outpatient settings (both hospital-based and private practice) offered less diverse and frequent experiences that were more asynchronous. This study differs from others in the field by increasing sample size, utilizing a validated survey instruments not reported in previous literature (other than initial validation by tool creators) and conducting one-on-one interviews with students after their clinical clerkship.

Context and findings: 4 forms of IP work

This study describes, from a student's perspective, the context and nature of these interprofessional experiences encountered. The results of the interprofessional experiences could be categorized as one of four main types that occur in clinical

settings (Reeves et al., (2010) (see Figure 6): networking, coordination, collaboration and teamwork. The most common interprofessional experiences that occurred in this first eight-week clerkship (in all setting types combined) were primarily networking and coordination with a few isolated forms of collaboration and one example cited of team-based interprofessional work (family conference surrounding care for a patient with a new spinal cord injury).

Networking can be described as a "loosely organized group of individuals from different health professions that meet and work together on a periodic basis (Reeves et al., 2010). Results indicated networking occurred both in the acute care and outpatient settings and occurred during social activities like monthly potlucks, sharing office space (inpatient settings: speech, occupational and physical therapists sharing space and in outpatient settings physical therapists, athletic trainers and prosthetists share space) and the occasional journal club meetings (involving physical therapy and orthopedic surgeons) and a one-time webinar in-service (physical therapy and orthopedic surgery).

Coordination is the next level of interprofessional work described by Reeves et al., (2010) and can be defined as "similar to interprofessional collaboration but a "looser" form of working arrangements whereby interprofessional communication and discussion is less frequent." Coordination can be further defined as a working relationship that involves communication and interaction with a profession other than one's own but is interdependent (Reeves et al., 2010). However, this form of interprofessional work is not considered a collaborative interaction-since the professionals tend not to be heavily interactive and problem solving, rather they are coordinating and or logistically planning for patient care. Examples of this type of interprofessional experience that were

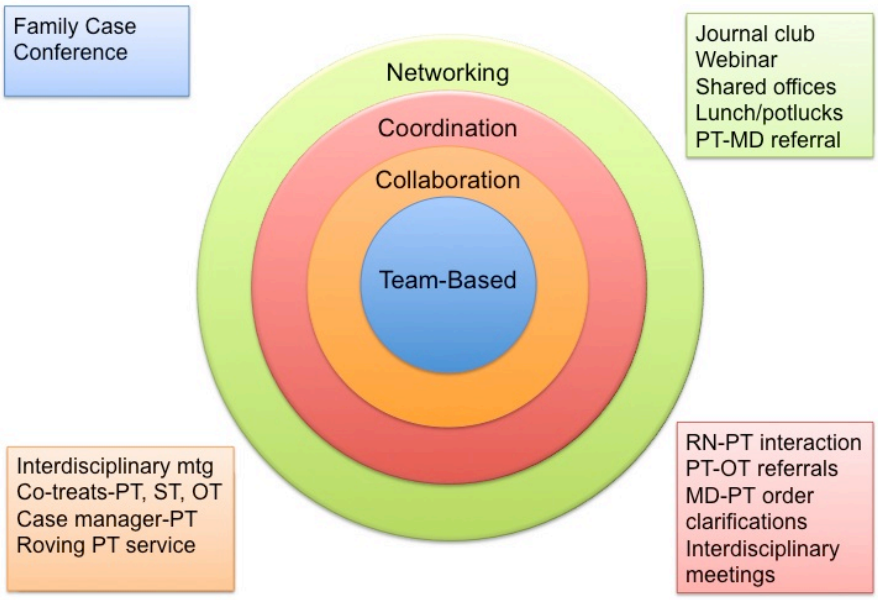
described by the students and were found in both the inpatient and outpatient settings included activities such as nursing and physical therapy doing daily patient updates and check-ins; physical, occupational and speech therapies coordinating treatments and referrals; physical therapy contacting physicians via phone or email regarding clarification of orders or post-surgical protocols; and lastly, some interdisciplinary team meetings that appeared to be physical therapy updates only—specifically functional mobility levels and equipment needs. Surprisingly, physical therapists never led the interdisciplinary meetings nor facilitated the meetings, and sometimes would only provide written updates for the physical therapy assistant to share while the physical therapist was absent.

Collaboration is the third type of interprofessional interaction described by Reeves et al., (2010) whereby different healthcare providers come together regularly to solve problems or provide services. The key to this type of interprofessional experience is the emphasis on collaborative problem solving. The few isolated examples of this type of interprofessional experience were displayed primarily in inpatient settings with examples such as direct patient care involving co-treatments of patients between physical and occupational therapy and/or physical and speech therapy; discharge planning between physical therapy and case management; and the occasional interdisciplinary meeting that would bypass the coordination level and take on a more problem-solving collaborative approach. One specific example of collaboration that a student reported involved the roving physical therapy service previoulsy provided. The physical therapist would join the physician in the evaluation of the patient and together-with the patient would decide on the treatment plan. While this type of collaboration

was unique, it did not qualify as team-based interprofessional work since the physical therapist and the physician were not acting as a team; they did not have a shared team identity; a consistent interdependence on one another, nor a shared responsibility for the patient overall.

Only one example was described by a student that represented a team-based level of interprofessional experience as described by Reeves et al., 2010. In an acute care setting, a patient participated in a team approach to his care as a result of a traumatic injury. Per the student account, the nurse practitioner, social worker, physicians, case managers, patient and family members all worked together as a rehabilitation team with a common goal and a shared vision to serve the needs of the patient following a traumatic spinal cord injury. Specifically this team held multiple patient and family meetings, attended by all team members, in order to create a treatment plan and goals that were mutually agreed upon by the patient and family. The team made a concerted effort to keep the lines of communication open so that all team members were updated and on the same page on a daily basis. The student reported feeling part of a “team” and felt the patient and family really appreciated all the professions coming together to meet the needs of the patient.

Figure 6 Forms of IP Work



If students, clinical instructors and academic faculty realize and learn that there are differing levels of interprofessional forms of work occurring in the clinical setting, students can take the initiative and advance their collaborative skills on an "as-needed basis". Not all interactions with health providers need to be collaborative or team based 100% of the time. For example, there are times when a physical therapist is working on advancing the short and/or long term goals of a patient status-post total knee arthroplasty or a patient with an anterior cruciate ligament reconstruction, whereby they don't necessarily need to speak daily with another healthcare team provider. Conversely a patient who requires multiple rehabilitation professionals such as occupational, speech and physical therapy or requires more complex care may need a more team-based approach. Therefore it is in the patient's best interest for students (and healthcare providers) to know when they need the expertise and advice from another healthcare professional but how to most efficiently and effectively access that

person and/or information. It is imperative that students have cultivated relationships with differing healthcare professionals other than physical therapists, to understand the various roles, responsibilities, and scope of practice and expertise of others. Accessing expertise from other healthcare professionals requires fine—tuned skills for open and transparent communication, development of interpersonal and trusting relationships, professionalism and the understanding of the "whole patient". Thus when our students attempt to access other professionals (nursing, pharmacy, dentistry, etc.) via various forms of interprofessional work—networking, coordinating, collaborating or team-based care—they have the skills to collaborate as efficiently and effectively as possible for the benefit of the patient.

Contingency approach

Effective and efficient delivery of healthcare services requires a "contingency approach" to interprofessional work (Reeves et al., 2010). Having students a) be able to recognize the level of interprofessional work that is needed for the patient—and b) be flexible, creative and assertive enough to maximize the selected form of interprofessional work needed, may enable students to build their collaborative skills thoughtfully and purposefully. Additionally if faculty and clinical instructors begin to understand and value these various levels of interprofessional work, they too can begin to encourage students to explore and reflect on the variations of interprofessional work in which they are involved and to challenge them to improve the form of interprofessional work in which they are involved if necessary. Expecting students to go into clinical practice settings and instantly take part in team-based care (especially during a first clinical clerkship) is an unattainable goal in our current healthcare delivery

model.

Patient-centered medical home models and accountable care organizations are advancing quickly. The physical therapy profession needs to strategize and develop a clinical education framework that builds upon the forms of interprofessional work that are currently occurring in our clinical settings. Recognizing and practicing within the various forms of interprofessional work allows students to begin to develop necessary collaborative skills-but in a more manageable and useful way.

Synchronous vs. asynchronous interprofessional education

Another unique finding of my research reveals that the context and the forms of interprofessional experiences occurred either synchronously (same time and same place, e.g. face to face, phone, webinar) and/or asynchronously (different time and different place e.g. electronic medical records, voicemail, email, fax). The acute care setting tended to consist of mostly reports of face-to-face synchronous interactions, though several students reported the use of EMR as a way to communicate and understand the "whole patient" for which they were involved in the care. EMR could be considered as both an asynchronous and synchronous interprofessional learning experience depending on how it is used. This implies that interprofessional experiences can fall on a spectrum of synchronicity depending on time and place (see figure 7). Both outpatient hospital-based and outpatient private practice settings tended to offer more interprofessional experiences with asynchronous experiences such as use of email, voicemail, facsimile and EMR. Few hospital-based outpatient settings offered EMR, while none of the outpatient private practice settings did. Students described asynchronous interprofessional experiences (e.g., EMR) as positive and impactful

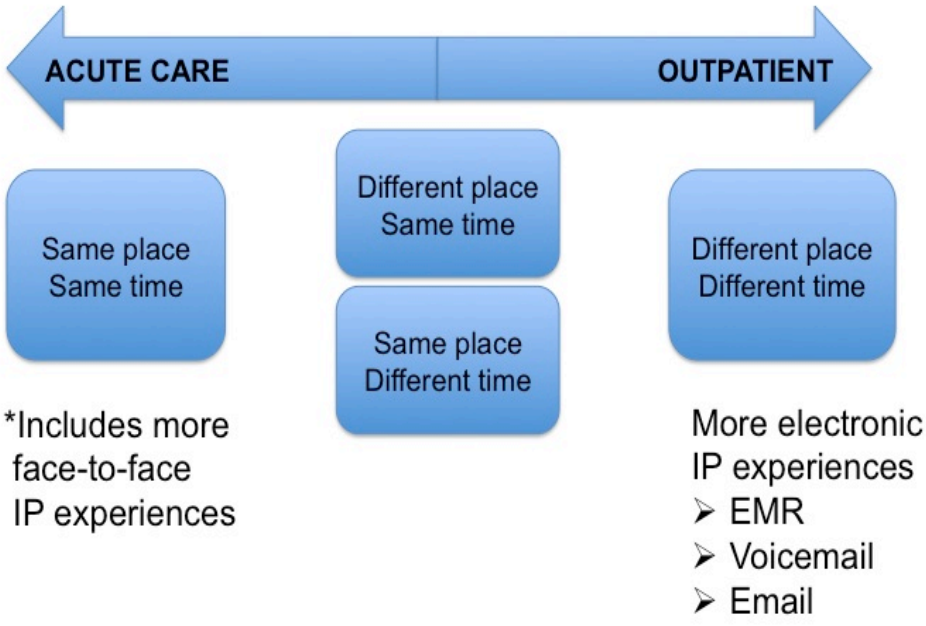
experiences. Through my observations in teaching, it appears students are “digital natives” and are accustomed to the use of smart phones and various social media platforms for maintaining relationships and communicating. As technology continues to be a platform for communication and delivery of healthcare (Kuziemsky & Reeves, 2012) asynchronous interprofessional education initiatives (due to the structural, timing and scheduling issues present in the university curriculum and the workplace settings) should continue to be explored as a viable method for interprofessional education and collaboration (Kuziemsky & Reeves 2012). Recent interprofessional education literature supports student learning about roles and responsibilities, communication and collaborative teamwork processes via online modules and discussion boards (Solomon & King, 2010, Carbanaro et al., 2008). These results suggest students appreciate learning to be collaborative team members both via face-to-face encounters and via online learning modules (Solomon and King, 2010). Interprofessional education initiatives in the classroom that use blended learning techniques such as e-learning and face-to-face learning receive positive feedback from students and optimize the benefits of both learning platforms (Solomon and King 2010, Hrananski 2008). The next step to authenticate the recognized benefits of

e-learning as a medium for interprofessional education would be to define a theoretical framework to help guide asynchronous interprofessional learning for students (Casmiro et al., 2009). Studies should continue to investigate to what degree and how we should utilize both synchronous and asynchronous interprofessional learning initiatives.

The results of my study indicate that both synchronous and asynchronous interprofessional learning experiences in clinical clerkships appeared to offer beneficial

learning experiences for the physical therapy students. Each clinical setting involved examples of asynchronous communications (EMR, email, fax, webinars, etc.). My results demonstrated that students found benefits from asynchronous interprofessional learning activities especially as an opportunity to understand the "whole" patient. Asynchronous interprofessional learning experiences should continue to play a role in all settings with clinical education and students should be asked to critically analyze and reflect on these experiences.

Figure 7 Synchronous vs. Asynchronous



Diversity and frequency of interprofessional experiences in acute care

Students reported that acute care settings offered the most frequent and most diverse interprofessional learning experiences including examples of each of the four forms of interprofessional work. If our goal is to expose students to an array of opportunities to take part in authentic interprofessional experiences in the clinical

education setting, then physical therapy clinical education program directors may want to consider placing students in acute care early in the curriculum. If the four forms of interprofessional work are introduced early and students are subsequently sent into the acute care setting, they may be able to more easily recognize these informal and implicit interprofessional workplace-learning opportunities. Recognizing these interprofessional experiences and having time to reflect on the real situations may create a richer clinical education experience for the students. Furthermore, these early acute care clinical clerkships could be studied further to determine how best to translate the benefits interprofessional experiences in acute care into settings with fewer opportunities for interprofessional learning such as outpatient settings.

Study limitations

The ISVS survey is based on the concept of interprofessional collaboration—and there are many items on the survey that address team oriented and collaborative experiences. My findings found only a few isolated examples of collaboration and team-based care that occurred in the acute care setting. Therefore if the students were not exposed to these interprofessional experiences it is plausible that the pre- and post-scores would remain level. My findings are consistent with what is reported in the interprofessional education literature (Wellman et al., 2012, Ruebling et al., 2013) but with other survey tools such as the Readiness for Interprofessional Learning Scale (Parsell & Bligh, 1999) and the Interdisciplinary Education and Perception Scale (McFayden &Webster, 2007). While the current study results were not statistically significant, a larger sample size using this survey tool could enhance the findings. Thirty-three subjects was a small sample size and may not be powered to detect small

differences in ISVS scores. Fortunately, my qualitative findings provided greater breadth and depth in the students' reports of interprofessional experiences.

In addition to sample size limitations, methodological challenges limits usefulness of self-report survey data to assess interprofessional collaboration in health education. Self-report surveys, such as the ISVS have no defined starting point from which the students can compare themselves and thus, respondents may underestimate/overestimate their collaborative abilities. Additionally, self-report surveys are often referred to as "mood surveys" and can reflect emotions and feelings at the time of taking the survey (hence excitement for clinical rotations during the pre-test and excitement for finishing the clinical at post-test). For the ISVS survey specifically, there were no additional published data with which to compare my results. While the addition of the qualitative data helped interpret current findings, useful and effective self-report tools could enhance research in interprofessional education in the future.

The research participants were a convenience sample. The entire cohort was invited to participate without applying exclusion criteria, but the findings may be limited to the specific physical therapy program addressed. Although sampling doctoral physical therapy students from multiple schools would increase generalizability, different timing and duration of clinical clerkships hinders such a design. Additionally one could argue that sampling first-year professional students during their first clinical clerkship of their professional schooling could be problematic as they are just beginning to better understand their uni-professional identity. While this may be true, it also provides a foundation for a possible longitudinal exploration of students as they progress through

all their clinical clerkships.

CONCLUSION:

A number of important clinical education implications emerge from this work. The nature and context of the interprofessional experiences reported by students in the clinical setting can be described as informal, unstructured and mostly unplanned opportunities. We should maximize these authentic experiences and educators should develop explicit learning objectives for these experiences especially for the earlier clerkships. Students and academic and clinical faculty should recognize the multitude of ways interprofessional experiences organically arise in the clinical setting. An introduction to the concepts and specific examples of interprofessional work in the clinical setting could be mapped out for faculty. For example, an online, interactive learning module could be implemented for ease of distribution to students and both academic and clinical faculty. This module would introduce the four forms of interprofessional work found in the clinical setting: networking, coordination, collaboration and team-based care. Specific examples of each form could be highlighted. Faculty development would be required to develop explicit learning objectives and assessment strategies for these various forms of interprofessional work. Students should be given time for critical reflection on their experiences. Assessment tools could focus less on assessing attitudes and beliefs and more on interprofessional knowledge acquisition (roles, responsibilities, scopes of practice) and behavioral components of collaborative practice (communication, reflection, problem-solving, conflict resolutions practice, etc.). Thoughtful and appropriate use of asynchronous technology platforms should continue to be explored in future studies.

The results of this examination of interprofessional experiences in the clinical clerkships implies that inpatient clinical settings offer the most diverse variety of interprofessional education experiences as compared to both outpatient hospital-based and outpatient private practice settings. Perhaps the committee on accreditation in physical therapy education (CAPTE) should encourage clinical education program directors to consider early acute care clerkships for earlier exposure to the forms of interprofessional work that are required to maximize patient centered care. Since many students complete their first year of physical therapy school and then journey into clinic for their first rotation (8-10 weeks), it is my opinion that we should initiate longitudinal interprofessional education initiatives to start within the first month or two of entrance into school so that students have a general understanding of interprofessional collaboration prior to starting their clerkships. Introducing interprofessional education initiatives should include an introduction into the forms of interprofessional work, as well as roles and responsibilities of healthcare team members and scope of practice issues. These initiatives can be delivered both asynchronously and synchronously. Because of the inherent complexity in the communities of practice in which students do their clerkships, it may be best to initiate and train students to recognize and appreciate the complexities of providing team-based care early in their academic careers versus waiting until they graduate. Since only one example of team-based care was reported perhaps we should consider implementing team-based simulation. If our goal is to graduate “collaborative-ready” physical therapy practitioners we have work ahead of us. Implementation of these recommendations may provide additional evidence to create best practice standards for interprofessional education and learning in physical therapy

clinical clerkships.

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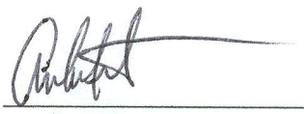

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