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ORIGINAL RESEARCH ARTICLE

Interprofessional Education and Service Learning: Improving Critical Thinking and Collegiality Through International Health Mission Trips

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Abstract

Purpose: This qualitative study examines how engaging interprofessional student teams in global health mission trips affects critical thinking, interprofessional engagement, and collegiality in health profession students. Two pedagogical strategies that foster broad integrated knowledge and skills are the use of interprofessional education (IPE) and international service-learning (ISL) opportunities. According to the World Health Organization (WHO)(2010), "Interprofessional education is a necessary step in preparing a 'collaborative practice-ready' health workforce that is better prepared to respond to local health needs."
Methods/Discussion: Nineteen health profession students, 15 females, 2 males, from a regional university in the southern United States, representing a range of health education programs including nursing, biology/pre-med, and physical therapy, participated in two global engagement student learning 10-day health mission trips (Uganda and Bolivia). Both trips afforded students the opportunity to work with medically underserved and impoverished populations with limited resources. Students were organized daily into interprofessional health care teams which worked together as single units addressing the needs of the people which they served. Students completed two written assignments during their trips: daily reflective journals of their experiences working in interprofessional teams; and each student's cultural story regarding a key cultural learning experience in critical thinking and collaboration. Each submission was then examined using a deductive six-step method of thematic analysis to determine how interprofessional teamwork affected collegiality and critical thinking in healthcare profession students.
Results/Outcomes: Thematic analysis of student reflective journals and cultural stories yielded two main themes with several sub-themes identifying the impact of international service learning in interprofessional healthcare teams. The first theme coded was *critical thinking and problem solving,* which supported sub-themes of balancing culture while providing optimal medical care,

overcoming communication barriers due to language and health literacy, and providing optimal medical care with limited resources. The second main theme was *IPE Collegiality and Collaboration* which supported sub-themes of understanding roles and building relationships, improved skills and self-efficacy, and a renewed sense and appreciation for patient-centered holistic, and simplified healthcare.
Conclusions/Relevance: Combining IPE working in healthcare teams during global health mission trips has demonstrated positive effects on student's critical thinking, collegiality, interprofessional engagement and mentoring. In addition, we found that these trips provide a unique environment which fosters an increase in their knowledge and respect for their role as a member of the healthcare team as well as the roles of other health professionals.

Introduction

Health practitioners and educators are continually challenged to engage in educational opportunities that improve interprofessional collaboration and critical thinking while providing care that is patient-focused, with all team members communicating in a common language that increases quality and safety of care and improves patient outcomes. Across the healthcare arena, organizations are encouraging professional education programs to increase opportunities for students to learn and work in collaborative interprofessional teams. Higher education institutions are increasing innovative teaching strategies outside the classroom to foster opportunities to develop well-rounded students who are ready to meet the demands of a dynamic healthcare environment. Two such pedagogical strategies that foster broad integrated knowledge and skills are the use of interprofessional education (IPE) and service-learning opportunities.

Review of Literature

Interprofessional Education

IPE occurs when two or more professions learn about, from, and with each other to enable effective collaboration and improve patient care and health outcomes.(Interprofessional Education Collaborative Expert Panel, 2011) IPE prepares health profession students to work in collaborative teams consistent with what is found in the healthcare environment. Research indicates that students educated using an IPE approach are more likely to become effective members of collaborative interprofessional teams (Bridges, Davidson, Odegard, Maki, & Tomkowiak, 2011). According to the World Health Organization (WHO)(2010), "Interprofessional education is a necessary step in preparing a 'collaborative practice-ready' health workforce that is better prepared to respond to local health needs," (p. 7).

Additional research indicates that healthcare students who receive education in IPE have a better understanding of the various roles of providers on a healthcare team which leads to a better understanding of each other's skill set and a more positive attitude toward collaboration (Carney et al., 2019; Homeyer, Hoffmann, Hingst, Oppermann, & Dreier-Wolfgramm, 2018). Students who are educated in programs with IPE as a foundation became more comfortable in identifying their own role; working with other health professions outside of their own discipline; and actively seek professional employment upon graduation in agencies that embrace an

interprofessional team approach to healthcare (Brashers, Phillips, Malpass & Owen, 2015; Carney et al., 2019).

Service Learning

Service learning has been an integral part of healthcare profession education and has been defined as "a structured learning experience that combines community service with explicit learning objectives, preparation, and reflection,"(Seifer, 1998, p. 274). International Service-Learning (ISL) is a service-learning opportunity that occurs outside of the country where the education program is located(Pechak & Thompson, 2009). There are numerous benefits to engaging students in international service learning, including but not limited to: increased cultural awareness and sensitivity, heightened use of critical and creative thinking skills, increased opportunity to improved cross cultural communication skills, innovative opportunities for students to develop global leadership skills. (Chakraborty & Proctor, 2019; Fell, Kennedy, & Day, 2019; Goodier, Uppal, & Ashcroft, 2015; Johnson & Howell, 2017; Pless, Maak, & Stah, 2011; Snyman & Donald, 2019; Thackrah, Hall, Fitzgerald, & Thompson, 2017). Haines, Stiller and Thompson (2017) demonstrated that Physical Therapy Assistant (PTA) students embarking on ISL in Kenya for a month increased opportunities for critical thinking, problem solving, and adapting emotions and actions appropriately within the context of the culture to facilitate student growth and increased confidence. Lattanzi & Pechak (2012) identified that in some students, international collaboration offers expertise and service, while in others it provides advanced knowledge and skills. They further suggest that all physical therapists in the United States can improve their own practices by understanding the larger societal impact of globalization and associated global health issues.

There are unique benefits to ISL experiences when students from different health professions collaborate and learn from each other in a complementary manner. Bentley, Engelhardt, and Watzak (2014) demonstrated evidence of an appreciation for mutual identification of patient mobility concerns and respect for difference in how each profession discerns those issues in nursing and physical therapy students. Bentley et al. (2014) suggest that physical therapy (PT) students provided great depth in their assessments of the limits of each individual's mobility and the interventions needed for improvement, while the nursing students provided greater breadth in their assessments of the need for each individual to restore health. By working in interprofessional teams, students sharing of knowledge and experience created complementary enhancement of knowledge that contributed to more efficient and effective care.

International health mission work provides students the opportunity to actively engage in all four domains of interprofessional core competency education: (1) interprofessional teamwork and team-based practice; (2) interprofessional communication practices; (3) values/ethics for interprofessional practice; and (4) roles and responsibilities for collaborative practice. (Interprofessional Education Collaborative Expert Panel, 2011). Engaging students in an environment which varies from the traditional US higher education classroom allows students to rely on each other's knowledge and expertise to solve clinical issues with limited resources. In addition, they gain a deeper understanding of both their role and the roles of other health professionals in delivering collaborative care which optimizes patient health and outcomes. Bridges et al. (2011) reports that although students are not initially likely to understand the complexities of relationships between professions, it is important to work towards a common IPE

framework that supports best practice early in their education. Therefore, placing students in an environment that encourages working together creates more team-focused and patient-centered accountability, which increases the quality and safety of care delivered.

One of the biggest challenges in providing optimal IPE learning environments in traditional higher education classrooms is the history of educating health profession students in discipline-specific silos. For example, the healthcare education of nurses and physical therapists generally occurs in separate discipline-specific cohorts, housed in different classrooms, floors, or even buildings on the same campus. Professionally segmented health education is reinforced through individual profession operations such as: independent staff and faculty meetings, budgets, and admission policies. etc. The challenge arises when the discipline-specific education model in which the student has engaged transitions to the clinical environment where novice professionals are encouraged to work collaboratively with others as a single healthcare team. The result is a health professions graduate who is not prepared to function as a member of a coordinated interprofessional team.

In 2009, the Interprofessional Education Collaborative (IPEC) and the WHO began to look more closely at the issue of discipline-specific education of health professionals and the problem with transition to a collaborative practice healthcare environment. New guidelines emerged which defined interprofessional education and how to effectively implement opportunities to practice collaborative learning in the academic settings (IPEC, 2011). The opportunity to co-treat, once a novel thought, was emerging as healthcare leaders sought to improve the efficiencies of personnel while reducing morbidity and mortality and improving patient outcomes. For example, in rehabilitation professions when a physical therapist and an occupational therapist co-evaluate and co-treat a patient collaboratively, both professionals learn from each other, and the patient benefits from the blended perspectives, expertise, and a broader range of clinical problem-solving skills. The goal is improved patient outcomes through increased communication and collaboration. The interprofessional model of care acknowledges that no one healthcare provider has all the answers, so discussion of best courses of action from multiple perspectives generally yields the optimal approach (IPEC, 2011).

Since 2011, healthcare education programs have begun to embrace the idea of creating interprofessional learning environments to better prepare students for the dynamic healthcare workforce. Many professional licensing and academic accreditation boards are now requiring documentation of interprofessional learning experiences (Commission on Accreditation of Physical Therapy Education (*CAPTE)*, 2020) Accreditation Commission for Education in Nursing (ACEN), 2020). According to Smith and Crocker (2017), these experiences are described as experiential learning, which provides students the opportunity to practice skills and techniques learned in the classroom while engaged in a real-world patient treatment. Combined experiential learning and service to community can result in improved health and wellness.

The purpose of this project was to examine an innovative method of interprofessional education that included combining students from different healthcare profession education programs into collaborative teams for global health mission trips. Our hypothesis was that by placing students in this non-traditional learning environment where they were required to work in interprofessional teams to deliver care would result in an increase in collegiality, interprofessional engagement and mentoring, and critical thinking.

Methods

A regional university in the southern United States hosted two, 10-day international health mission trips: one to west central South America and one to the eastern Africa. Both trips afforded students the opportunity to work with medically underserved and impoverished populations with limited resources. For many students, it was their first trip outside of the continental United States.

A total of nineteen health profession students, 17 females, 2 males, representing a range of health education programs including nursing(13), biology/pre-med (2), and physical therapy (4), participated in the trips. Twelve students attended the trip to Africa and seven students attended the trip to South America. There were no students that participated in both trips. These students were in various stages of their educational programs ranging from completion of their first year of study to current enrollment in their senior year of their respective programs.

Each student was enrolled in a course that required completion of two written assignments for each of the mission trips: (1) a daily reflection journal of their experience in working in interprofessional teams; and (2) a story of a key cultural learning experience involving critical thinking and collaboration. The goal of these assignments was to gain knowledge of the impact on interprofessional global health mission work on learning from the student perspective. Grzelak and Glickman (2014) reported that the use of reflective journaling by healthcare students during international immersion is a common method of qualitative data collection to assess student learning.

The interprofessional health mission trips were led by two senior faculty at the university who partnered with a local non-profit international mission organization to arrange the trips. A nurse who was employed with the non-profit organization also participated in the trips and served as a liaison between the academic groups and international health mission sites. During both trips, students rotated daily into interprofessional health care teams, which worked together as single units addressing the needs of the people they served. Each day, the teams left to set up a clinic in a remote area, including but not limited to bush villages, inner city jails, schools, mountain villages, and government sponsored clinics. On each trip, student teams cared for more than 1500 people over the 10-day mission and saw a wide variety of both acute and chronic disease issues. Patients included men, women, and children, ages 2 weeks to 99 years of age.

Analysis of Data

For this project, data were analyzed using a deductive six-step method of thematic analysis (Braun & Clarke, 2006). Initially, student journals and cultural stories were read and re-read for familiarization and identification of recurring themes. Reoccurring comments that identified patterns of words, phrases, or concepts in the student writings of both their cultural story and daily reflective journals were collected and themes were identified. The collection of writings from the students were analyzed in aggregate, without respect for discipline-specific findings. Following initial identification of recurring words, phrases, and/or meanings, these excerpts were placed into similar sub-groupings and then summarized into sub-themes and themes. Care was taken to reduce author bias during coding by relying on the actual wording within each

submission and each author confirming the categorizations. While thematic analysis involves noting how often a theme is reinforced through the data, the strength of a theme is not necessarily dependent on the number of occurrences but is based upon whether the theme touches on significant aspects of the research question (Braun & Clarke, 2006).

One of the central questions was to determine how interprofessional teamwork affected collegiality, collaboration, and critical thinking among healthcare profession students, as reflected by common themes expressed in their cultural stories and daily reflective journals. Although the authors believed these trips would foster these elements among their students, attention was directed to careful coding of key words or phrases, so as to reduce confirmation bias. Furthermore, the students were not made aware of our hypothesis or intentions to foster these central themes but were completing required student writing assignments.

Results

Thematic analysis of student reflective journals and cultural stories yielded several themes identifying the impact of ISL in interprofessional healthcare teams. Tables 1 and 2 further illustrate those themes that reflect critical thinking/problem solving and collaboration/collegiality, respectively.

Critical Thinking and Problem Solving

Critical thinking and problem solving is defined as the ability to work through a problem or issue with limited resources and lack of access to traditional healthcare diagnostics and interventions. Student healthcare group success in problem-solving relied heavily on the ability of the group to creatively assess, diagnose, and formulate a care strategy with the limited resources students had available to them (basic healthcare assessment instruments such as a stethoscope and limited amounts of medications and wound supplies to care for injuries and illnesses). In the critical thinking and problem-solving area, three sub-themes emerged. The first sub-theme, "balancing culture while providing optimal medical care" permeated the student comments in both the key cultural stories and the daily reflective journals. The realism of healthcare occurring in the context of culture was frequently cited and included aspects of religion, social justice, human rights, hygiene, clothing modesty, and health literacy.

The second sub-theme identified was "overcoming communication barriers due to language and health literacy". In both countries, a foreign language along with various localized or tribal dialects were spoken. Language diversity presented continual challenges to develop critical thinking strategies to enhance communication. In the South American trip, students who were fluent in Spanish , were able to pair up with other students who needed language assistance and serve as translators in addition to members of the healthcare team. In Africa, although English and Swahili are the official languages, there are multiple local dialects in the bush; therefore, local interpreters were often necessary to facilitate communication. Local medical staff at clinics, local community leaders and pastors, and family members often served as translators for the healthcare teams.

Health literacy, defined as a person's ability to access, process, and comprehend medical information, can be a risk factor for poor health outcomes (Mogobe et al., 2016). Both health

mission trips were set in areas of extreme poverty and lack of access to regular healthcare; therefore, relative health literacy levels of clients were poor. Students were challenged to work collaboratively to explain in "layman terms" their assessments, diagnoses, and treatment plans to clients and families, and to also come up with alternative solutions when traditional American treatments were not readily available in the international setting.

Finally, a third sub-theme of "providing optimal medical care with limited resources" emerged from student comments. This sub-theme truly reflects creative problem solving in a setting of limited medical resources, limited access to ongoing care, and varying cultural norms in regard to illness and disease progression. Student comments often reflected the challenges in delivering their definition of optimal care in a suboptimal environment while at the same time professionally struggling with opposing cultural views on health priority, knowledge, and value.

Collegiality and Collaboration

During data coding and thematic analysis, three additional sub-themes related to collegiality and collaboration were identified. The sub-themes reflect the process students engaged in understanding interprofessional roles and building relationships between healthcare team members and clients, improving individual skill, and developing self-efficacy, which all led to a renewed sense of appreciation of patient-centered, holistic, and creative healthcare.

Interprofessional role understanding and relationship building stemmed from multiple student comments about regular discussions between professions regarding patient examination and treatment. Many of the discussions occurred in the evenings after the clinical experience and in the mornings over breakfast or during the drive to the next clinical site, meaning students had time to digest their clinical experience and then reflect on their role and what they learned. The healthcare teams shared common dormitory-style living spaces, ate all meals together, and prepped for the clinical days as a team. These shared experiences enhanced the comradery and collegiality among the teams and the group as a whole.

The second sub-theme in this area was cited frequently surrounding the concepts of medical skill improvement which led to the enhancement of self-efficacy. Albert Bandura(2012) states that self-efficacy beliefs influence motivation, which can help people persevere in the face of difficulties. Development of this self-confidence concurrent with mastery of medical skills is very important in the development of an effective clinician. Hayward et al.(2013) notes that novice physical therapists report that their increased confidence developed simultaneously with the expansion of their professional skills and emerging trust in their observational skills and clinical intuition. Furthermore, a review of medical students discusses that self-efficacy beliefs facilitate the learning and development of medical students.(Klassen & Klassen, 2018). Regular sharing of information among students allowed complementary learning while practicing skills and receiving feedback from students in different professions.

The last sub-theme identified a "renewed sense and appreciation for patient-centered holistic, and simplified healthcare." Students who are familiar with the many regulations in their training surrounding proper documentation, billing, legal concerns, and other administrative controls can easily lose focus on the patient. Several student comments expressed a renewed, simplistic "re-set" of thought that refocused the healthcare student on caring for the patient in the best practical way possible at the moment given the limitations of resources.

Table 1: Critical Thinking/Problem Solving Theme

Excerpts from Student Writings	Student Perspective Coding	Sub-themes	Theme
Learned to appreciate and respect that medical practice occurs in the context of culture. This includes religion, modesty in clothing, social justice, human rights, hygiene, and health literacy.	Respect culture – religion, modesty, social justice/human rights. Overcome patient's lack of basic hygiene and health knowledge.	Balancing culture while providing optimal medical care	Critical Thinking and Problem Solving
Meaning of time differs here - patients would walk miles and wait hours to be seen (and not be angry)	Respect cultural differences in value placed on time and waiting		
Modesty can hinder exam - how to best practice while respecting clothing culture.	Formulate proper exam techniques in context of cultural modesty		
Cultural challenge of little involvement of adult males in raising children and helping social health problems (i.e., men having multiple children, yet vacant from child rearing)	Understand the role of men and fathers in the local culture and the larger effect on social health problems		
Realization that spirituality/religion is central in healthcare and not only "ok", but sometimes expected to pray during care delivery	Respect religious culture and expectation of participation as caregiver		
Learned to respect value of other cultures - example of head and neck pain in young girl carrying water frequently on her head for great distances: modified instruction after consulting with pastor and other students/professors.	Provide medical advice in context of cultural chores, family, and local community expectations		
Cultural challenge of little involvement of adult males in raising children and helping social health problems (men having multiple children, not involved with child rearing)	Understand the role of men and fathers in the local culture and the larger effect on social health problems		
Non-English-speaking medical patients ranging from pediatrics, wound care, through all body systems with very limited resources. Language barriers, different dialects, and translation were a continual challenge and will prove helpful to	Overcome language barrier between visiting medical team and local culture. Devise effective non-verbal patient communication and provide language translation process	Overcoming communication barriers due to	Critical Thinking and Response

my practice back home. Challenge of instructing patients on exam maneuvers with translator and different culture (i.e., manual muscle testing)		language and health literacy	Critical Thinking and Response
Differences in medical practice, such as wound care, enlightened my perspective to appreciate treatment with less resources, and not be judgmental, as the needs of the patients were being met.	Allow flexibility and deference in optimal care practices as resources were very limited. Overcome patient's lack of medical supplies and money.	Providing optimal medical care with limited resources	
Challenge of working with patients incarcerated in foreign country	Provide medical care within resources and rules of the local jail		
Challenge of education regarding puberty in girls and readiness and understanding of menstruation; availability of supplies	Overcome lack of education regarding the culture of young women's menstrual needs.		
Awareness of AIDS, sickle cell, TB, and malaria as major health concerns in Uganda. Appreciated diversity of medical problems related to culture/area - i.e., scalp fungus; intestinal mass from eating dirt, jiggers in feet	Understand the diversity and uniqueness of medical conditions found in a foreign land		

Table 2: IPE Collegiality and Collaboration Theme

Excerpts from Student Writings	**Student Perspective Coding**	**Sub-themes**	**Theme**
The medical mission interprofessional group lived and shared meals together which provided continual opportunities to discuss how other professionals would approach and treat patients they saw today. Able to share perspectives on wide range of medical issues (i.e., LBP and sickle cell anemia). Collegiality and interprofessional relationship-building went on after clinic into the evening hours.	Active and continual sharing of various perspectives of healthcare disciplines regarding patient care was helpful to understand roles and values of each profession.	Understanding Roles and Building Relationships	IPE Collegiality and Collaboration
PT students working with area orthopedic physician in clinic -	Learned orthopedic content and appreciated	Understanding Roles and	

sharing exam and treatment perspectives	differences in musculoskeletal treatment in foreign land.	Building Relationships	IPE Collegiality and Collaboration
Able to learn from each other; good to practice my skills; get feedback from other students in different professions. Not familiar with pediatrics initially, learned from others, increased confidence.	Felt good to practice skills while learning and receiving feedback from different health discipline	Improved Skills and Self-Efficacy	
Learned exercise techniques from PT students. PT students learned much about nursing assessment. Nursing students learned about scoliosis screening and ortho exam from PT students. PT students from different years worked together on neurological techniques for babies/toddlers, and manipulation techniques on adults	Discipline specific information readily shared and accepted between students to foster optimal Interprofessional education. (IPE)	Improved Skills and Self-Efficacy	
This whole experience shifted my focus from the hierarchy of healthcare in the USA towards the patients' needs and how each professional had different insight to help patient.	Created a healthy re-alignment and emphasis that the patient is the center of healthcare, despite the regulatory and legal environment of modern USA healthcare.	Renewed sense and appreciation for patient-centered holistic, and simplified healthcare	

Discussion

Combining IPE and ISL demonstrated positive effects on student's critical thinking, collegiality, interprofessional engagement and mentoring, as assessed by thematic analysis of student comments written in their reflective journals and cultural stories While reading, reflecting, and coding student comments in their writings, it was apparent that student comments expressed themes and sub-themes that supported our hypothesis that IPE combined with ISL improves critical thinking, collegiality, and collaboration. Furthermore, there is evidence to support the WHO framework of all four domains of interprofessional core competency education including teamwork, communication, values/ethics, and roles and responsibilities for collaborative practice.

There are few opportunities in traditional healthcare education for interprofessional groups of students to share information across disciplines while providing patient care. IPE ISL trips greatly enrich innovation and the holistic learning experiences of the involved students. Institutions of higher learning are encouraged to incorporate IPE ISL into the health professions curriculum as interprofessional healthcare teams will continue to become more commonplace in contemporary practice, especially in in-patient facilities.

One unanticipated outcome of this project was the carry-over effect of IPE and relationship building amongst students from different professions into the post-clinic hours. These students lived, ate, and traveled together, and it was frequently observed and reported that conversations regarding patient care occurred at all hours. This resulted in better student role identification and understanding of each profession's roles and for treatment planning and grouping for the next treatment day.

Limitations

Several limitations of this study are identified. One limitation is a relatively small sample size of 19 subjects representing nursing, nurse practitioners, physical therapy, and pre-med students. It could be argued that a more interprofessionally diverse group of students would have enriched the experience even further. Another limitation is the use of deductive reasoning as the underlying basis for the thematic analysis, which may have introduced author bias, meaning that the researchers developed a hypothesis first, then applied the coding process to the submitted reflective journals and the key cultural story. This method may have contributed to researcher bias in the authors looking for specific comments. Another source may be attributable to the relative familiarity of the students with the researchers as they were also professors and leaders of the IPE ISL trips. This blending of roles may have influenced students to complete assignments with grading in mind. The use of independent coders instead of professors who were on the trips would have eliminated author bias. Students also volunteered for these trips, potentially making them more amendable to collegiality and collaboration, then other future healthcare workers. More research is needed to measure the actual long-term impact of the IPE ISL experience on professional practice. Although our thematic analysis was conducted in aggregate, without regard for discipline, differences among nursing, physical therapy, and pre-med students that participated in these trips may have revealed discipline specific themes. Future research could look at the durability of the experience outcomes and impacts of current professional life several years post-graduation with professionals.

Conclusion

Interprofessional international service learning provides a unique opportunity for health profession students to expand their knowledge and practice as collaborative members of the healthcare team. Students who participate in IPE ISL trips as part of their healthcare education demonstrate increased ability to identify their unique role while understanding the role of other health professions as members of a patient-centered team. Students who participated in this project experienced a vastly different culture; learned to practice with language barriers; developed enhanced critical and creative thinking; and increased their appreciation of the impact on health outcomes of coordinated team care. The student writings supported our hypothesis that the IPE ISL experience increases collegiality, interprofessional engagement and mentoring, and critical thinking among the involved students.

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