

# Exploring Interprofessional Activities that Address Poverty, Social Determinants of Health, Homelessness, and Chronic Pain

**Whitney Lucas Molitor PhD, OTR/L, BCG** *Department of Occupational Therapy, University of South Dakota*

**Allison Naber OTD, OTR/L, CLT-LANA** *Department of Occupational Therapy, University of South Dakota*

**Tracy Cleveland EdD, MS, PA-C** *Physician Assistant Studies Program, University of South Dakota*

**Carissa Regnerus MA, RDH** *Department of Dental Hygiene, University of South Dakota*

**Chelsea Wesner MPH, MSW** *Master of Public Health Program, University of South Dakota*

**Kory Zimney PT, DPT, PhD** *Department of Physical Therapy, University of South Dakota*

**Sabina Kupersmidt PhD** *Department of Nursing, University of South Dakota*

## Abstract

**BACKGROUND** Critical healthcare issues are impacting society. Interprofessional learning must be designed to match this complexity.

**PURPOSE** We designed and implemented multiple interprofessional learning activities to address serious topics in health care to determine if learning experiences founded on critical health issues resulted in increased knowledge among the interprofessional team of learners.

**METHOD** This was an observational, cross-sectional cohort study. Participants were students enrolled in health science and medical programs at a university in the Midwest U.S. Learning activities consisted of journal club, Pain C.A.R.E., poverty simulation, or Strategies for Health.

**RESULTS** Outcomes for student learning indicated strong agreement on teamwork variables. Faculty involvement sustained the implementation of interprofessional learning experiences.

**CONCLUSION** Addressing social determinants of health as the learning content of an interprofessional learning activity was an effective method for increasing students' confidence and comfort within an interdisciplinary team.

---

*Received:* 02/11/2021 *Accepted:* 04/01/2021

© 2021 Molitor, et al. This open access article is distributed under a Creative Commons Attribution License, which allows unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Despite healthcare spending exceeding any other developed nation, positive health outcomes in the U.S. remain low (National Academy of Sciences, 2013). One in five adults experience pain (Centers for Disease Control and Prevention [CDC], 2020), thirty-eight million Americans live in poverty (United States Census, 2018), and rates of chronic illness are on the rise (National Academy of Sciences, 2013). In addition, minority groups and those with lower income disproportionately experience poorer health outcomes. Although a variety of factors contribute to health status, increasingly, evidence shows that social and economic influences (referred to as social determinants of health) play a large role (CDC, 2018; National Academy of Sciences, 2013). For example, level of education and socioeconomic status highly correlate with health outcomes, as they influence an individual's ability to seek medical care, to understand and to follow health recommendations, and the likelihood they will be able to afford services, both preventative and after the outset of disease or disability (Arpey et al., 2017; Hahn et al., 2015).

While there is growing literature linking the social determinants of health (SDH) to health outcomes, less has been written regarding the professional preparation required to ensure health professionals are knowledgeable on how to address such factors. Interprofessional education (IPE) has emerged as a means of ensuring healthcare professionals are equipped with the necessary skills to provide effective team-based care that is responsive to both social and medical factors. Dedicated efforts have been made over the last decade to reform health and medical education, placing the client at the center of the healthcare team, as an equal partner in the healthcare process (Institute of Medicine [IOM], 2015). A need now exists to expand the focus and scope of IPE to more intentionally address critical healthcare issues, many of which relate to the social determinants of health. Doing so requires deliberate curricular development and a dedicated planning process to successfully execute learning activities. To offer solutions, this report describes a multi-faceted IPE event that can be replicated and has been evaluated with a validated tool.

## Literature Review

Interprofessional education provides opportunities for students to develop perceptions of their professional role as well as the roles of other members of the healthcare

team that can potentially generate positive clinical decision making and a patient-centered approach to healthcare (Interprofessional Education Collaborative, 2016; Roberts et al., 2018). Within the health sciences, IPE originated to reduce medical errors by increasing communication among the healthcare team. Effective IPE reduces the presence of isolated learning silos which previously limited the mutual understanding of health professions and ultimately resulted in negative health outcomes once students were in practice (Prast et al., 2016; World Health Organization [WHO], 2010). Interprofessional education promotes understanding of professional roles, prevents duplication of services, and improves patient compliance and health outcomes (Roberts et al., 2018). The structure of IPE provides an opportunity for “students from two or more professions [to] learn about, from and with each other to enable effective collaboration and improve health outcomes” (WHO, 2010, p. 7). Ultimately, IPE aims to improve health through the development of new models for practice in which health professionals and the public learn to enhance collaboration in healthcare delivery and outcomes (National Center for Interprofessional Practice and Education, 2020).

A noted barrier to IPE development and implementation is the confusing array of delivery formats in the current literature and the lack of details allowing for replication (Fox et al., 2018). Current approaches to IPE span from two-hour sessions to semester-long learning opportunities. Activities include varying numbers and types of healthcare disciplines and educational formats which range from online modules to case-based learning opportunities (Lapkin et al., 2013). Due to variability in structure and execution, requirements for successful IPE implementation are inconclusive in the literature (Fox et al., 2018). Moreover, before IPE experiences can be evaluated for efficacy of outcomes for patient safety, quality of care, patient satisfaction, or improved health outcomes, learning experiences must be analyzed to determine the necessary resources which will be required to carry out a successful IPE learning experience.

The IOM (2015) recommends IPE activities be population-directed and include an education-to-practice emphasis. As such, we selected activities that were relevant to a population perspective and related to the SDH.

## *Chronic Pain*

Understanding chronic pain and learning to collaborate to design interventions to mitigate the effects of this epidemic condition, was deemed a critical topic for the IPE event. The IOM (2011) has stated that more than 116 million U.S. adults are suffering from chronic pain and treating this condition collaboratively is critical (Gordon et al., 2018). This staggering number, along with the current opioid crisis, has led to the National Institutes of Health (2016) National Pain Strategy which, in part, highlights the need to develop professional education and training specific to the area of pain education, treatment, and management. When students gain an improved understanding of pain they improve their attitudes and beliefs regarding pain (Zimney et al., 2018). This understanding should encompass the multidimensional nature of pain and the need for multidisciplinary approaches to more complex cases.

## *Poverty*

It was determined that a critical focus area for IPE should be to explore health beyond clinical care. As poverty is multidimensional, no one healthcare professional can address this complexity alone. Currently 12% of the U.S. population experiences poverty (Semega et al., 2019). In South Dakota the rate is higher, at 13.1% (United States Census Bureau, 2019). Impoverished individuals often have poorer health outcomes and may be under or uninsured (Khullar & Chokshi, 2018). There is prior evidence that interprofessional poverty simulations have a positive impact on the education of students enrolled in nursing programs (Phillips et al., 2020).

## *Social Determinants of Health*

Research increasingly emphasizes the impact SDH have on health outcomes (Friedman et al., 2015). According to the Centers for Disease Control (2018), health outcomes are largely impacted by social factors including the built environment, physical conditions, level of income, and neighborhood safety. Social determinants are partially responsible for inequalities in health status within and between communities. Healthy People (2020) has developed initiatives that address health equity by developing programming and tracking outcomes specific to health access and health equity. The CDC (2018) emphasizes a multidisciplinary approach to

achieving health equity from various perspectives that address SDH.

In this study we explored an educational strategy which describes the implementation and evaluation of a set of IPE learning experiences that are offered to students in the School of Health Sciences (SHS) regularly. The IPE experience was designed as a structured learning experience that would be accessible to students at varying stages in their education. The objectives of this educational strategy were to:

1. Design a cafeteria-style menu of IPE activity options to address several critical topics in health care;
2. Determine if experiences founded in critical health issues resulted in increased knowledge of the IPE team;
3. Determine the human resources and logistics required to offer multiple IPE events on a single day.

Through a review of the literature and faculty expertise, we identified four key focus areas for IPE implementation: the ability to analyze and apply concepts from scholarly journal articles to a patient case with healthcare disparities, understanding the complexities of chronic pain and how to manage this condition, gaining a perspective of how poverty impacts health and access to resources, and exploring the social determinants of health through interactive, game-based learning.

## **Methods**

### *Study Design*

Efficacy of this IPE implementation was explored through an observational, cross-sectional cohort study with a descriptive posttest design (Portney, 2020). Each of the four IPE activities was considered as a separate experience. Approval was obtained from the university's Institutional Review Board (approval number IRB-19-181) for a retrospective data analysis. A waiver of informed consent was obtained.

### *Participants*

This IPE experience took place at a university in the Midwest U.S. Participants were undergraduate

and graduate-level students who were eligible if they were currently enrolled in one of the 10 health science programs at the university and if they elected to do so after solicitation from their department's IPE representative. Scheduling of dedicated time for IPE occurred in advance across multiple disciplines. In order to meet accreditation and departmental IPE objectives many of the health science programs prioritized students to be in attendance. The number of students in each activity was determined by the number of facilitators who were available and experienced in each activity. Each student selected one of the four IPE activities and was then enrolled in an IPE module through the university's learning management system. All students enrolled in the IPE modules were included as participants for data analysis.

### *Data Source*

The Jefferson Teamwork Observation Guide (JTOG; Lyons et al., 2016) was utilized as a post-test outcome measure to assess teamwork behaviors. The JTOG assesses 14 characteristics of teamwork rooted in interprofessional competencies of leadership, roles and responsibilities, communication, values and ethics, and teamwork. It also includes open ended responses regarding teamwork. The JTOG has been shown to have good reliability and validity for assessing the behaviors of an interprofessional healthcare team (Lyons et al., 2016). Following the IPE learning experience, students rated the degree to which their interprofessional group demonstrated characteristics of a well-functioning team.

### *Activity Design*

As a means of prioritizing IPE across the University, an Interprofessional Health Education Center (IHEC) was formed. The purpose of the IHEC is to advance IPE through curriculum and faculty development, scholarship, service learning, and developing local, regional, and national collaborators for IPE initiatives. The center is responsible for developing and organizing IPE experiences for students across the university's School of Health Sciences. The IHEC committee worked collaboratively with faculty across disciplines to design, develop, and carry out an integrated IPE experience. This article reports on the first event, which consisted of four distinct activities: poverty simulation,

journal club, Pain C.A.R.E. (Comprehensive, Advocate, Respectful, Excellence), and Strategies for Health board game.

Each activity was carried out concurrently in a three-hour timeframe (see activity objectives in Table 1). Due to logistics, this event was planned one year in advance to select a day and time that met the needs of all health sciences programs involved. Individual activities were planned and created by designated faculty facilitators. The feasibility of each event was determined in close collaboration with faculty and the IHEC committee. Factors including space requirements, room size, supplies needed, number of faculty facilitators, and activity-specific needs were explored. The event required one ballroom size room and three standard-sized classrooms. Students from 10 health science disciplines along with 33 faculty facilitators participated in the event. The committee requested one staff or faculty volunteer from each discipline for every 10 of their participating students.

### *Interprofessional Activity Descriptions*

#### ***Journal Club***

A journal club was designed to provide students with a collaborative learning experience through the review, discussion, and application of content with selected journal articles as an introductory experience in interprofessional education. The primary objective of this activity was to provide students with a safe learning environment in which to develop a better understanding of their profession and the roles of everyone on the healthcare team. The journal club activity also aimed to increase the learners' understanding of healthcare disparities faced by individuals who are homeless while working as part of an interprofessional healthcare team where learners support and learn from one another for the betterment of the client. Students worked in small groups to collaboratively design unique community-based programs that, when combined back as a large group, would holistically meet the client's needs.

The journal club activity was selected as it is an effective approach to fostering critical thinking skills. The ability to analyze literature is critical for the provision of evidence-based practice. Journal clubs allow for interprofessional collaboration to promote

clinical knowledge and skills (Friedman et al., 2019; Good & McIntyre, 2015). These skills are “vital for all healthcare professionals throughout their careers” (Lucia & Swanberg, 2018, p. 7). Participation in journal clubs provides students an opportunity to distinguish facts from assumptions when evaluating the literature and to analyze literature for effective clinical decisions (Good & McIntyre, 2015; Lucia & Swanberg, 2018). Increased understanding of varying perspectives and a deeper appreciation of current evidence have both been cited as beneficial outcomes of journal club activities (Lucia & Swanberg, 2018).

### *Pain C.A.R.E.*

Pain C.A.R.E. (unpublished; developed by Zimney) was developed to broaden and deepen the learners’ understanding of pain and its individualized nature. This immersion activity sought to address the multidimensional nature of pain while providing information from an IPE perspective, implications for patients and families, and treatment options. Other objectives were to develop an understanding of a multi-dimensional comprehensive pain assessment and management plan, as well as of the misbeliefs commonly held. The Pain C.A.R.E. activity utilized case scenarios for the development of patient-centered pain assessment and management plans. Finally, it addressed inadequately managed pain from an ethical, safety, social, and political perspective using an unfolding case study.

Students were first provided the client’s chief complaint and history of present illness, which included contextual and medical details. As teams engaged in dialogue they were provided additional details to the case only upon their request. For example, teams that inquired as to the patient’s sleep and diet patterns were provided these details using responses developed by faculty prior to the event as they would if they were conducting an actual patient interview. Periodically faculty facilitators prompted discussion by asking open-ended questions such as ‘What are some behavioral factors at play regarding how pain is affecting the patient’s lifestyle and ability to socialize?’. Students developed a problem list, formulated a treatment plan, and created a concept map for their suggested plan of action. During group discussion and session debriefing similarities and differences among professional roles were discussed

in addition to treatment recommendations which were responsive to the client factors (social and medical) described in the case.

### *Poverty Simulation*

The poverty simulation was not designed by university faculty but was purchased as a licensed kit from the Missouri Community Action Network (n.d.). The simulation provides a 4-hour experience for participants to assume the identity of families facing poverty. This simulation consists of an active learning strategy that puts learners into the interprofessional teams (“families”) who are experiencing poverty to help students understand the barriers that are encountered. The kit was adopted to fit interprofessional concepts through the assignment of various familial roles to each team. The team must collaboratively work together to achieve their goals and succeed as a family unit. The objectives of the poverty simulation experience include promoting poverty awareness among learners, increasing the learners’ understanding of barriers associated with poverty, and working as units or teams by sharing common goals while supporting and learning from each team member. The simulated scenario sets the task for participants to bring a “family” through one “month” (simulated by four 15-minute periods) using available resources. During debrief, participants were invited to discuss their experiences and what they learned while the faculty facilitators discussed their perspectives.

### *Strategies for Health*

*Strategies for Health* is an interprofessional educational game developed within the SHS (Feldhacker, et al., 2021) around five key domains of SDH: neighborhood and built environment, economic stability, health and healthcare, social and community context, and education. During a 60-minute game, students collaborate to determine the best course of action to manage the unique social and medical factors for game characters. The development of characters within the game included an extensive literature search along with data from federal, tribal, and state databases to accurately represent populations across urban, rural, and reservation communities. During gameplay, students work as a team to help characters respond to emerging events/scenarios related to each of the five

social determinants by spending or earning tokens. For example, a character may have trouble with transportation to medical appointments, may be unable to pay their rent, or may not understand the directions for a medication they were recently prescribed. Students must address each issue and collaborate to determine which profession may be equipped to intervene. If a character does not have adequate tokens for an event that requires the expenditure of resources, the interprofessional student team will discuss the scope of practice for various health professions and

identify one or more professionals to address the need. The characters neither start nor end the game on a level playing field, which leads to a rich discussion and debriefing on health equity and insight into the root causes of poor health outcomes. Debrief following game play included students reflecting on their own experiences versus those of the game characters. Faculty also asked students to provide insight regarding how SDH impacted the character’s health and access to resources.

After the IPE event, students will:

---

Journal Club

- Develop an understanding of the roles of everyone on the healthcare team.
- Understand the health disparities faced by homeless individuals.
- Work in interprofessional teams where learners support and learn from each other for the betterment of the patient.

---

Pain C.A.R.E.

- Discuss the multidimensional nature of pain and its components, implications for patient-families, and relationship to clinical interventions.
- Discuss clinical assessment and measurement approaches and misbeliefs common to healthcare professionals related to pain management.
- Describe interprofessional strategies for the planning, intervention, and monitoring of pain-management outcomes.
- Develop and discuss as part of an interprofessional student group the rationale for patient-centered pain assessment and management plans based on authentic patient cases (actual or scenarios).
- Discuss inadequately managed pain assessment and management from an ethical, safety, social, and political perspective.

---

Poverty Simulation

- Promote poverty awareness among learners
- Increase understanding of problems associated with poverty
- Work in interprofessional teams where learners share common goals, support, and learn from each other

---

Strategies for Health Board Game

- Increase awareness of SDH
  - Develop strategies that address or respond to social, economic, health, education, and environmental needs that arise throughout the game.
- 

**Table 1.** *Objectives for Interprofessional Activities*

Once relevant topics were determined, the IHEC committee met to ensure the learning experience aligned with this population-directed focus. IHEC adopted the Interprofessional Learning Continuum Model as the framework (IOM, 2015) in which four related constructs are at work: a continuum of learning (including formal and informal experiences), learning

outcomes, individual and population outcomes, and system outcomes. For this event, we focused on the continuum of learning through an emphasis on application to practice. All activities included faculty with experience in clinical and community settings and debriefing was structured to emphasize the realities and complexities commonly encountered in practice. We

also emphasized learning outcomes through posttest and population-focused health outcomes relevant to individuals and communities with varying resources. Students were enrolled in one activity of their choosing through a course on the university's learning management system, Desire2Learn. Utilization of these courses allowed for efficient communication and posting of required pre-work materials that were easily accessed by students and faculty assisting

with the IPE activities. Pre-work learning activities, including a review of the activity's materials and the TeamSTEPPS® Training Pocket Guide (Agency for Healthcare Research and Quality, 2018), were consistent across all four learning activities. Similarly, all students completed the JTOG after the IPE event. Table 2 outlines the individually assigned learning activities before and during each IPE activity.

Before the Event	During the Event
	<b>Journal Club</b>
Review and reflect on three journal articles:	Students were placed into groups and provided discussion questions to explore the assigned articles.
- Comparison of the healthcare team to a competitive sports team (Bosch & Mansell, 2015)	Students then worked to establish a collective understanding of their role in the care of the client presented in the article(s). They shared their role and learned about the roles of other group members.
- Methods for addressing healthcare disparities of underserved communities (Vanderbilt et al., 2015)	Students worked collaboratively to develop an interprofessional plan of care.
- Unmet healthcare needs of homeless adults (Baggett et al., 2010)	
	<b>Pain C.A.R.E.</b>
Students viewed learning modules and recorded lectures regarding chronic pain.	Students were instructed to come up with medical history questions after reviewing a case study. Students determined:
	- What each discipline would assess.
	- A method for measuring progress.
	- Approaches for treatment, asking what each discipline would do and what the minimum and maximum treatments would be.
	- Societal and social effects.
	Students then engaged in a large group discussion, share out, and debriefing.
	<b>Poverty Simulation</b>
Students reviewed a welcome letter that introduced the activity.	Students were assigned an interprofessional "family" and "home." They read instructions and introduced themselves to their team.
	Facilitators provided the "rules of engagement" then students visited stations that provide "services" during four 15-minute periods that simulate one week of life in poverty each. Students had to adapt to unexpected obstacles.
	Debriefing and mutual sharing of impressions.
	<b>Strategies for Health</b>
Students completed a pretest regarding knowledge of SDH and interprofessional attitudes (results are not reported in this article).	Students were assigned to interprofessional teams and completed a reading on SDH and watched a brief (24 minutes) pre-recorded lecture on SDH in urban, rural, and reservation communities
	Students then played <i>Strategies for Health</i>
	Debriefing guided by the Promoting Excellence and Reflective Learning in Simulation method.

**Table 2.** *Learning Activities Before and During the IPE Experience*

**Analysis of Activity**

*Data Analysis*

Data were analyzed using SPSS for Windows version 25 (IBM Corp, 2017). We calculated mean and standard deviation for all JTOG items. Each dependent variable was then separated into an isolated collapsed scale using the item designations and the number of items as outlined in the JTOG. We then completed content analysis (Elo et al., 2014) for responses to the item ‘describe one new thing, either positive or negative, that you observed today about teamwork.’ This process included reading through all responses to get a sense of the meaning. We then categorized similar responses using a coding scheme in MS Word. Existence of content which were positive, negative, or related to the SDH were coded. Next we grouped similar codes and re-read the responses to clarify meaning and to determine themes.

*Results*

In total, 125 students from 10 disciplines signed up for the four activities. The number of actual participants included in data analysis was  $n=107$  based on JTOG completion. All participants were college students (ranging from sophomore year of undergraduate to third year of graduate) and most were female (80%,  $n=86$ ). Distribution of health professional students was achieved between and within groups (see Tables 3 and 4). Activity participation included: journal club ( $n=14$ ), strategies for health ( $n=15$ ), Pain C.A.R.E. ( $n=28$ ), poverty simulation ( $n=50$ ). Facilitators required to conduct each event varied from 2-20. Faculty facilitators for each event included: journal club (2), Pain C.A.R.E. (6), poverty simulation (20), Strategies for Health board game (5).

Discipline	<i>n</i>
Addiction Counseling and Prevention	5
Dental Hygiene	22
Health Science	7
Medical Lab Science	6
Public Health	6
Nursing	3
Occupational Therapy	16
Physician Assistant	19
Physical Therapy	16
Social Work	6

**Table 3.** *Participation by Discipline*

Event	Disciplines Involved
Journal Club	HSC, MLS, MPH, OT, PA, SOCW
Pain C.A.R.E.	ACP, DH, HSC, MPH, OT, PA, PT
Poverty Simulation	DH, HSC, NURS, OT, PT, SOCW
Strategies for Health boardgame	MPH, PA, PT, SOCW

**Table 4.** *Participation by Discipline and Event*

Note. ACP = Additional Counseling and Prevention, DH = Dental Hygiene, HSC = Health Science Major, MPH = Master of Public Health, MLS = Medical Lab Sciences, OT = Occupational Therapy, PA = Physician Assistant PT = Physical Therapy, SOCW = Social Work

Items on the JTOG are classified into one of five categories: values and ethics (3 items), roles and responsibilities (3 items), communication (4 items), teamwork (2 items), and leadership (2 items). Each item was ranked on a 4-point Likert scale, ranging from strongly agree (1) to strongly disagree (4), with

an option for ‘not applicable.’ Responses rated as ‘not applicable’ were removed during analysis and were not factored into descriptive findings. Descriptive statistics for each item, separated by IPE activity are listed in Table 5 with lower scores indicating stronger agreement.

JTOG Item	Journal Club	Pain C.A.R.E.	Poverty Simulation	Strategies for Health
	M (SD)			
There appeared to be a team leader who coordinated the discussion <sup>1</sup> .	1.50 (0.65)	1.93 (0.72)	1.78 (0.84)	2.00 (0.85)
The team leader facilitated the discussion rather than dominated it <sup>1</sup> .	1.36 (0.63)	1.36 (0.68)	1.72 (0.88)	1.33 (0.90)
Members of the team came prepared to discuss the case/situation from their profession-specific perspective <sup>3</sup> .	1.36 (0.63)	1.36 (0.49)	1.68 (0.98)	1.47 (0.64)
Members of the team who were involved in the case/situation contributed to the discussion <sup>4</sup> .	1.36 (0.75)	1.36 (0.62)	1.48 (0.81)	1.60 (0.51)
Discussion was distributed among all team members <sup>4</sup> .	1.43 (0.65)	1.50 (0.64)	1.46 (0.79)	1.40 (0.51)
Members of the team appeared to understand the roles and responsibilities of other members of the team <sup>3</sup> .	1.57 (0.65)	1.46 (0.51)	1.56 (0.79)	1.67 (0.62)
Team members appeared to have respect, confidence, and trust in one another <sup>2</sup> .	1.29 (0.47)	1.32 (0.48)	1.38 (0.73)	1.47 (0.52)
Team members listened and paid attention to each other <sup>4</sup> .	1.07 (0.27)	1.32 (0.48)	1.34 (0.72)	1.40 (0.51)
Team members listened to and considered the input of others before pressing their own ideas <sup>4</sup> .	1.29 (0.47)	1.40 (0.50)	1.38 (0.73)	1.40 (0.51)
Team members added other supporting pieces of information from their profession-specific perspective regarding the case/situation <sup>3</sup> .	1.21 (0.43)	1.29 (0.46)	1.54 (0.86)	1.47 (0.52)
The opinions of team members were valued by other team members <sup>2</sup> .	1.21 (0.43)	1.29 (0.46)	1.28 (0.70)	1.53 (0.64)
Team members appeared to feel free to disagree openly with each other’s ideas <sup>2</sup> .	1.36 (1.1)	1.68 (0.90)	1.64 (0.83)	1.67 (0.62)
Team members sought out opportunities to work with others on specific tasks <sup>5</sup> .	1.36 (0.63)	1.43 (0.63)	1.40 (0.73)	1.47 (0.64)
Team members engaged in friendly interaction with one another <sup>5</sup> .	1.10 (0.27)	1.32 (0.48)	1.26 (0.69)	1.33 (0.49)

**Table 5.** *Descriptive Statistics for JOTG by IPE Activity*

Note. Leadership<sup>1</sup>, Values and Ethics<sup>2</sup>, Roles and Responsibilities<sup>3</sup>, Communication<sup>4</sup>, Teamwork<sup>5</sup>

Based on the collapsed JTOG scales, score ranges were based on the total number of items in each category. For the variables of values and ethics and roles and responsibilities, scores ranged from 3-12. Lower scores signify more agreement. Results for values and ethics indicated  $M=4.3 \pm 1.78$ , while roles and responsibilities were  $M=4.5 \pm 1.78$ . Communication consisted of 4 items. The scale ranged from 4-16. Results indicated  $M=5.56 \pm 2.24$ . The scale for teamwork and leadership ranged from 2-8. The teamwork variable indicated  $M=2.67 \pm 1.14$  while leadership was  $M=3.34 \pm 1.35$ .

Overall, ratings indicated that students felt the IPE activities allowed groups to demonstrate characteristics of a well-functioning team.

This finding was supported by participant comments which were provided in response to the prompt “describe one new thing, either positive or negative, that you observed today about teamwork”. Data analysis of comments resulted in three themes: apprehension, cohesion, and awareness.

Comments categorized under apprehension included a notion that teams were not comfortable interacting initially. Several comments indicated that it took up to 15 minutes before students were able to feel comfortable addressing the task at hand. One participant stated: “It took after the first 15-minute[s] for me and the other participant to really work together as a team and figured out how to do everything. I think this is representative of health care. You don’t always click, but you learn how to work together as a team to provide the best quality.” Other students commented on a need to advocate for their professional role in addressing the issue their group.

Many students felt that their groups interacted cohesively. Several participants noted that their groups “communicated effectively” and were “appreciative with everyone’s opinion.” One participant indicated “Everyone came together and worked very well in a high stress situation. Everyone in the group was always saying “ok so what can I do next”, which I thought was really cool!”. Another participant commented on the students present in their group, indicating “ Four people with very different medical careers and levels of experience worked together very

well even though we were missing some key players of the medical team, we found common ground quite easily.”

Because each activity addressed SDH we also looked at the responses to determine if students made comments about the content of the experience. These items were classified under the awareness theme. Students reported a better understanding that the challenges presented were “not the patient’s fault” and that factors such as transportation were “a limiting factor for most families to acquire basic needs.” One student added a personal perspective, stating “This was my favorite IPE simulation yet. I learned how to sit in someone else’s shoes. I am a single mom however I have a lot of support from my family and realized I have it easy compared to other single Moms/Dads who don’t have a lot of support and resources. I feel humbled and blessed at this point.” Another student stated, “I observed a group of people who did not know each other come together and work for the common good of “our family” to help us survive the challenges of living in poverty.”

## Discussion

The purpose of this educational strategy was to design and implement IPE activities responsive to a variety of topics affecting health in order to explore the efficacy of these IPE experiences to determine if they resulted in increased knowledge of the IPE team. We also wanted to identify the resources and logistics required to offer multiple IPE events on a single day. Outcomes showed that a large-scale IPE event incorporating multiple students at different levels of education (varying levels of pre-licensure as well as licensure) and faculty was practical. A total of  $n=107$  students representing 10 disciplines and 33 faculty facilitators were involved across the four IPE activities. Each activity included students from at least four different disciplines (strategies of health game =4, journal club =6, poverty simulation =6, and pain care =7). Not only did the activities represent students from a variety of disciplines, but each activity also included a group of interprofessional faculty facilitators. The variety of disciplines participating within each of the activities attributed to the depth and breadth of the IPE experience by offering a broad range of perspectives from the student participants and faculty facilitators. Our study

expanded on previous research which has been carried out with fewer professional disciplines (Guilding et al., 2018). This large-scale event supported the WHO's definition of IPE which asserts learning "about, from and with" (2010, p. 7) other professionals.

Extensive planning and preparation beginning one year in advance, along with the continued involvement of departmental IHEC champions, encouraged university-wide buy-in and commitment from different disciplines to prevent common logistical barriers such as scheduling conflicts or time constraints (Boet et al., 2014). By allocating time for this event one year in advance we were able to ensure student and faculty involvement across programs. In addition to the effective collaboration required among faculty from a variety of disciplines to facilitate effective IPE, students must also collaborate to be successful in the IPE experiences. Students in the SHS routinely receive training in TeamSTEPPS® early in their programs but the participants were also asked to read the TeamSTEPPS® pocket guide (Agency for Healthcare Research and Quality, 2018) before the event to establish a common foundation for teamwork and to enable good communication. Participants in all four events reported a strong overall agreement with JTOG items. This indicates that students perceived that they and their interdisciplinary teams were able to work collaboratively when faced with an important topic in healthcare. This was supported by open ended responses regarding students' perceptions of their learning and of teamwork. Students that demonstrate the ability to embrace and fulfill their respective professional roles in an IPE context that addresses current critical healthcare issues such as chronic pain, poverty, homelessness, or SDH will be more likely to demonstrate a transfer of those skills into an interdisciplinary practice context (Vanderbilt et al., 2015). Opportunities for IPE which focus on pertinent challenges that professional students will face as healthcare providers facilitate professional socialization and student preparation for practice (Joynes, 2018).

Activities were found to be similar in the level of team collaboration that occurred between students. This provided the committee with support for future IPE activity development and supports that IPE addressing SDH, homelessness, poverty, and pain can be carried

out in multiple ways (game-based learning, simulation, discussion, case study). Overall, students agreed with JTOG statements indicating that the IPE activities allowed for the interprofessional group to demonstrate the characteristics of a well-functioning team. The noted agreement with learning materials was based on the students' experiences within a single IPE activity. As students participated in only one of the four IPE activities, students did not rate the selected activity in comparison to other activities. Whether students were collaborating to explore current evidence to address pain management or to meet the needs of society, student responses on the JTOG demonstrated the benefits of these formal learning experiences that provided an opportunity for students to learn with, from, and about one another's professions (IOM, 2015; WHO, 2010). As each learning activity was slightly different, exploring outcomes of each individually may provide additional insight for future events.

Developing and facilitating multiple relevant IPE opportunities for health sciences students from numerous professions is not only possible but also can positively contribute to the professional socialization process required for effective interdisciplinary practice. We encourage additional studies that offer a clear articulation of successful IPE event formats and transparency regarding the planning process and outcomes to work towards a best practice model for IPE implementation. Addressing social determinants of health is multifaceted and requires the skillset of various health professionals. We found that students reported learning about SDH to be a meaningful experience. As such, we recommend that programs aiming to implement IPE for students to address various determinants of health should ensure activities are designed with a group of interprofessional faculty who can offer varied perspectives relevant to all professional disciplines that will be present at the event. The activities should be relevant to the learners, as was the case in our study which used real-life situations students may encounter in the clinic or community. These faculty should also be present during the event in order to engage with learners and offer insight during debriefing. Getting buy-in from multiple disciplines and administration is also critical to the successful implemental of IPE as is the sharing of outcomes from events which can help to expand and strengthen the professional IPE literature.

### Limitations

The results of this IPE experience may have limited generalizability due to the interventions occurring at one university. The social factors included in the activities were structured around issues in the rural Midwest where this experience took place and may not be as pertinent to all audiences. We elected to utilize an assessment tool that did not include capturing pre event data. While the JTOG offered important insights into these activities, not having comparison data from pre to posttest is noted as a limitation. Lastly, some, but not all faculty and students had previously completed implicit bias and diversity training. Ensuring that participants were fully equipped to learn about diversity, equity, and inclusion in relation to SDH, poverty, and chronic pain would have further strengthened this activity.

### Conclusion

There is a lack of consistent research regarding the most effective IPE format, making it difficult for educators to develop efficacious IPE opportunities for their students. Our committee addressed this challenge by calling upon faculty across the University to design and help facilitate multiple IPE experiences within one overarching event. Our efforts to expand IPE to a larger student and faculty population required transparency in the intent of the event and the requirements (time, effort). The use of critical topics in healthcare as IPE content was effective for increasing students' confidence and comfort within an interdisciplinary team. Interprofessional education opportunities, such as these, are centered on current challenges in healthcare. We envision the efficacy of this method of IPE development, rooted in important health issues relevant to the learners, will provide a framework for future IPE implementation that readily contributes to the interdisciplinary culture for the next generation of healthcare providers.

### Acknowledgments

The authors would like to thank all who helped make this IPE experience a success, including the many students, faculty, and staff who contributed and participated. We wish to acknowledge the work of all current and former members of the IHEC.

### References

- Agency for Healthcare Research and Quality. (2018). Pocket Guide: TeamSTEPPS. <https://www.ahrq.gov/teamstepps/instructor/essentials/pocketguide.html>
- Arpey, N. C., Gaglioti, A. H., & Rosenbaum, M. E. (2017). How socioeconomic status affects patient perceptions of health care: A qualitative study. *Journal of Primary Care & Community Health*, 169-175. <https://doi.org/10.1177/2150131917697439>
- Baggett, T. P., O'Connell, J. J., Singer, D. E., & Rigotti, N. A. (2010). The unmet health care needs of homeless adults: A national study. *American Journal of Public Health*, 100(7), 1326-1333. <https://doi.org/10.2105/AJPH.2009.180109>
- Boet, S., Bould, M.D., Burn, C.L., & Reeves, S. (2014). Twelve tips for a successful interprofessional team-based high-fidelity simulation education session. *Medical Teacher*, 36, 853-857. <https://doi.org/10.3109/0142159X.2014.923558>
- Bosch, B., & Mansell, H. (2015). Interprofessional collaboration in health care: Lessons to be learned from competitive sports. *CPJ/RPC*, 148(4), 176-179. <https://doi.org/10.1177/1715163515588106>
- Center for Disease Control & Prevention. (2020). *Chronic pain and high-impact chronic pain among U.S. adults, 2019*. <https://www.cdc.gov/nchs/products/databriefs/db390.htm#:~:text=In%202019%2C%2020.4%25%20of%20adults,adults%20aged%2065%20and%20over>
- Centers for Disease Control & Prevention. (2018). *Social Determinants of Health: Know What Affects Health*. <https://www.cdc.gov/socialdeterminants/index.htm>
- Elo, S., Kaarianinen, M., Kanste, O., Polkki, R., Utriainen, K., & Kyngas, H. (2014). Qualitative content analysis: A focus on trustworthiness. *Sage Open*, 4, 1-10. <https://doi.org/10.1177/2158244014522633>
- Feldhacker, D. R., Wesner, C., Yockey, J., Larson, J., & Norris, D. (In Press). Strategies for health: A game-based interprofessional approach to teaching social determinants of health: A randomized controlled pilot study. *Journal of Interprofessional Care*. <https://doi.org/10.1080/13561820.2020.1850660>
- Fox, L., Ondersb, R., Hermansen-Kobulnickya, C.J., Nguyena, T., Myrana, L., Linna, B., & Horneckera, J. (2018). Teaching interprofessional teamwork skills to health professional students: A scoping review. *Journal of Interprofessional Care*, 32(2), 127-135 <https://doi.org/10.1080/13561820.2017.1399868>

- Friedman, E.E., Dean, H.D., & Duffus, W.A. (2015). Incorporation of social determinants of health in the peer-reviewed literature: A systematic review of articles authored by the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. *Public Health Reports*, 133(4), 392-412. <https://doi.org/10.1177/0033354918774788>
- Friedman, K.A., Herman, S.W., & Fornari, A. (2019). Medical education using minimal technology: Achieving professional development. *Medical Education Online*, 24, 1622365. <https://doi.org/10.1080/10872981.2019.1622365>
- Good, D.J., & McIntyre, C.M. (2015). Use of journal clubs within senior capstone courses: Analysis of perceived gains in reviewing scientific literature. *Journal of Nutrition Education and Behavior*, 47(5), 477-479. <https://doi.org/10.1016/j.jneb.2015.05.003>
- Gordon, D. B., Watt-Watson, J., & Hogans, B. B. (2018). Interprofessional pain education-with,from, and about competent, collaborative practice teams to transform pain care. *Pain reports*, 3(3), e663. <https://doi.org/10.1097/PR9.0000000000000663>
- Guiding, C., Hahn, R. A., & Truman, B. I. (2015). Education improves public health and promotes health equity. *International journal of health services: Planning, administration, evaluation*, 45(4), 657-678. <https://doi.org/10.1177/0020731415585986>
- Healthy People. (2020). *Social determinants of health*. <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>
- IBM Corp. (2017). *Statistical Pack for Social Sciences*. Version 25.0. Armonk, NY: IBM Corp.
- Institute of Medicine. (2011). Committee on Advancing Pain Research, C., & Education. *Relieving pain in America: A blueprint for transforming prevention, care, education, and research*: National Academies Press
- Institute of Medicine. (2015). *Measuring the impact of interprofessional education on collaborative practice and patient outcomes*. Washington, DC: The National Academies Press.
- Interprofessional Education Collaborative. (2016). *Core competencies for interprofessional collaborative practice: 2016 update*. Washington, DC: Interprofessional Education Collaborative.
- Joyes, V. C. T. (2018). Defining and understanding the relationship between professional identity and interprofessional responsibility: Implications for educating health and social care students. *Advances in Health Sciences Education*, 23, 133-149. <https://doi.org/10.1007/s10459-017-9778-x>
- Khullar, D., & Chokshi, D. (2018). *Health, income, and poverty: Where we are and what could help*. Health Affairs Health Policy Brief. <https://doi.org/10.1377/hpb20180817.901935>
- Lapkin, S., Levett-Jones, T., & Gilligan, C. (2013). A systematic review of the effectiveness of interprofessional education in health professional programs. *Nurse Education Today*, 33, 90-102. <https://doi.org/10.1016/j.nedt.2011.11.006>
- Lucia, V.C., & Swanberg, S.M. (2018). Utilizing journal club to facilitate critical thinking in pre-clinical medical students. *International Journal of Medical Education*, 9, 7-8. <https://doi.org/10.5116/ijme.5a46.2214>
- Lyons, K.J., Giordano, C., Speakman, E., Smith, K., & Horowitz, J. A. (2016). Jefferson Teamwork Observation Guide (JTOG): An instrument to observe teamwork behaviors. *Journal of Allied Health*, 45 (1), 49-53c. <https://doi.org/10.1037/t64225-000>
- [Missouri Community Action Network](http://www.povertysimulation.net/about/) (n.d). *The Poverty Simulation*. <http://www.povertysimulation.net/about/>
- National Center for Interprofessional Practice and Education. (2020). *About interprofessional practice and education*. <https://nexusipe.org/informing/about-ipe>
- National Academy of Sciences. (2013). *U.S. health in international perspective: Shorter lives, poorer health*. Washington (DC): National Academies Press. <https://doi.org/10.17226/13497>
- National Institutes of Health. (2016). *National pain strategy: Objectives and updates*. <https://www.iprcc.nih.gov/National-Pain-Strategy/Objectives-Updates>
- Phillips, K. E., Roberto, A., Salmon, S., & Smalley, V. (2020). Nursing Student Interprofessional Simulation Increases Empathy and Improves Attitudes on Poverty. *Journal of Community Health Nursing*, 37(1), 19-25. <https://doi.org/10.1080/07370016.2020.1693095>
- Portney, L. G.(2020). *Foundations of clinical research: Applications to practice* (4<sup>th</sup> ed.). F.A. Davis.
- Prast, J., Herlache-Pretzer, E., Frederick, A., & Gafni-Lachter, L. (2016). Practical strategies for integrating interprofessional education and collaboration into the curriculum. *Occupational Therapy in Health Care*, 30(2), 166-174, <https://doi.org/10.3109/07380577.2015.1107196>
- Roberts, L.D., Davis, M.C., Radley-Crabb, H.G., & Broughton, M. (2018). Perceived relevance mediates the relationship between professional identity and attitudes towards interprofessional education in first-year university students. *Journal of Interprofessional Care*, 32(1), 33-40. <https://doi.org/10.1080/13561820.2017.1366896>
- Semega, J., Kollar, M., Creamer, J., & Mohanty, A. (2019). *Income and Poverty in the United States: 2018*. United States Census Bureau. <https://www.census.gov/library/publications/2019/demo/p60-266.html>

United States Census Bureau. (2019). *Quick Facts: South Dakota*. <https://www.census.gov/quickfacts/SD>

United States Census Bureau. (2018). *Income and Poverty in the United States: 2018*. <https://www.census.gov/library/publications/2019/demo/p60-266.html>

Vanderbilt, A. A., Dail, M. D., & Jaber, P. (2015). Reducing healthcare disparities in underserved communities via interprofessional collaboration across health care professions. *Journal of Multidisciplinary Healthcare*, 8, 205-208. <https://doi.org/10.2147/JMDH.S74129>

World Health Organization. (2010). *Framework for action on interprofessional education & collaborative practice*. Geneva, Switzerland: World Health Organization. Retrieved from [http://whqlibdoc.who.int/hq/2010/WHO\\_HRH\\_HP\\_N\\_10.3\\_eng.pdf](http://whqlibdoc.who.int/hq/2010/WHO_HRH_HP_N_10.3_eng.pdf)

Zimney, K., Louw, A., Johnson, J., Peppers, S., & Farrell, K. (2018). Effects of pain neuroscience education on physician assistant students' understanding of pain and attitudes and beliefs about chronic pain. *South Dakota Medicine*, 71(11), 506-511.

### Corresponding Author

Whitney Lucas Molitor, PhD, OTR/L, BCG

University of South Dakota  
Department of Occupational Therapy  
Sanford Coyote Sports Complex Rm 366  
414 E. Clark Street  
Vermillion, SD 57069

Whitney.LucasMolitor@usd.edu