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Evaluating Interprofessional Competencies and Knowledge of and Confidence in Addressing Social Determinants of Health

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Evaluating Interprofessional Competencies and Knowledge of and Confidence in Addressing Social Determinants of Health

Abstract

Promoting health requires coordinated, team-based interventions responsive to multiple determinants of health. This study aimed to determine if interprofessional competencies and knowledge of and confidence in addressing the social determinants of health improved following an interprofessional learning event. A two-group randomized controlled trial was used to determine study outcomes among 408 health science students from 14 health profession programs in the Midwest. Formed groups were randomly assigned to the customary medical-based (control) or social determinants of health focused (experimental) case study. In small groups students engaged in a case study simulation and offered recommendations for intervention. Small improvements in knowledge of the social determinants of health were found among participants in both groups. Interprofessional competencies largely showed no significant differences between using the case study which emphasized social determinants of health compared to a medically based case study. The suggestions for interventions resulted in more frequent recommendations related to socioeconomic status and access to health care among students in the experimental group versus the recommendation of medically based health services among students in the control group. Additional qualitative research is recommended to learn more about how groups collaborated to form these recommendations.

Keywords

Social determinants of health, interprofessional education

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Evaluating Interprofessional Competencies and Knowledge of and Confidence in Addressing Social Determinants of Health

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ABSTRACT

Promoting health requires coordinated, team-based interventions responsive to multiple determinants of health. This study aimed to determine if interprofessional competencies and knowledge of and confidence in addressing the social determinants of health improved following an interprofessional learning event. A two-group randomized controlled trial was used to determine study outcomes among 408 health science students from 14 health profession programs in the Midwest. Formed groups were randomly assigned to the customary medical-based (control) or social determinants of health focused (experimental) case study. In small groups students engaged in a case study simulation and offered recommendations for intervention. Small improvements in knowledge of the social determinants of health were found among participants in both groups. Interprofessional competencies largely showed no significant differences between using the case study which emphasized social determinants of health compared to a medically based case study. The suggestions for interventions resulted in more frequent recommendations related to socioeconomic status and access to health care among students in the experimental group versus the recommendation of medically based health services among students in the control group. Additional qualitative research is recommended to learn more about how groups collaborated to form these recommendations.

Introduction

Access to adequate medical care accounts for 20% of health outcomes while social and economic factors (level of education, family support, safety, and income status), along with health behavior, and the physical environment make up the remaining 80% of modifiable health factors (Hood et al., 2016). Thus, health is made up of a combination of genetics, life circumstances, and environmental factors (World Health Organization [WHO], 2021). The non-medical factors are referred to as social determinants of health (SDH), which constitute “the conditions in which people are born, grow, live, work, and age, including the health system” (WHO, 2021, para. 1). Health data support the notion that higher levels of formal education and having higher socioeconomic status lead to more effective health care utilization, improved health outcomes, a higher quality of life, and greater wellbeing for individuals and populations (O’Neill Hayes & Delk, 2018). Occupational therapists have highlighted how these social factors play a role in shaping occupational participation, promoting health, and improving quality of life (Hammell, 2020).

Understanding SDH can help explain why health outcomes vary among and within groups. Most often these differences result in lower health outcomes, higher incidence of disease and disability, poorer living conditions, and less opportunity for meaningful occupational engagement among minority populations and those experiencing poverty (National Academies of Science, Engineering, and Medicine, 2017). Despite health policy and government programs aimed at addressing how SDH impacts health outcomes, current medical approaches within the United States (U.S.) lack preventative measures which address the social factors that affect health outcomes (Magnan, 2017; Stern, 2018; Winship et al., 2019). As a result, fragmented care dispersed between multiple providers and entities has resulted in higher health care spending and increased rates of preventable hospitalizations (Diaz, 2018; Frandsen et al., 2015). A more effective approach would be to promote a health care workforce that emphasizes SDH, lifestyle factors, health habits, and occupational participation (Hood et al., 2016; Pizzi & Richards, 2017). This approach would promote health and foster collaboration among health professionals (Winship et al., 2019).

Background

Interprofessional education (IPE) is utilized as a means of educating future health care professionals on “best practices” of providing health care (Cox et al., 2016). The World Health Organization (2010) defined IPE as learning experiences involving students from at least two professional disciplines working collaboratively to learn “about, from, and with each other to enable effective collaboration and improve health outcomes” (p. 7). Interprofessional learning includes recognition of professional scope and values while also establishing how these skills and roles fit within the larger health care system and team. Frequently interprofessional learning fosters the development of skills needed to address trends in health care (Interprofessional Education Collaborative, 2016; Wallace & Benson, 2018) which will ideally mirror the complexity of practice demands in the

current health care system (Cox et al., 2016). Interprofessional learning experiences can promote professional communication, understanding of the scopes of practice of peer professionals, and build trust and respect of fellow health care professionals while aiming to promote higher quality health care (Nester, 2016).

Few studies have explored how effective interprofessional education is at equipping learners to better understand the SDH (Bultas et al., 2016; Uden-Holman et al., 2015) and a need exists for research to connect IPE to the broader health system and population health (Brandt et al., 2014). Of the published research, many articles are from outside occupational therapy and instead are from professions such as pharmacy, nursing, and medicine (Kiles et al., 2020; Martinez et al., 2015; McDonald et al., 2015; Sharma et al., 2018; Williams et al., 2016). These published approaches to teaching about SDH include problem-based learning, which has shown effectiveness at increasing critical thinking regarding population health (Leon et al., 2015), flipped classroom instruction to promote knowledge of sociocultural and ecological influences on health (Lane et al., 2018), game-based instruction (Feldhacker et al., 2021), and development and implementation of new curricular modules to address SDH (Singh et al., 2019). Students who engage in community-based service-learning have shown improved comfort working with diverse populations and a deeper understanding of the SDH (Ryan et al., 2015; Snyman & Geldenhuys, 2019).

Occupational therapy professionals have a significant role in addressing SDH (Braveman, 2016), which necessitates educational experiences that provide future clinicians with the skillset to improve health outcomes through understanding and working to improve SDH. The emphasis on population health and social determinants of health in the Occupational Therapy Practice Framework (American Occupational Therapy Association [AOTA], 2020) and the accreditation standards for occupational therapy education (Accreditation Council for Occupational Therapy Education, 2018) support the need for methods to educate occupational therapy students regarding these topics. As such, the purpose of this study was to determine if the use of a case study that incorporated SDH content during an IPE event was effective at increasing interprofessional competencies and knowledge of and confidence in addressing SDH among health science students. The authors hypothesized that exposure to a case study that emphasized SDH would result in increased knowledge of SDH among participants in the experimental group.

Methods

The researchers implemented a two-group randomized controlled study. This design was well suited to compare changes in interprofessional competencies and knowledge of and confidence in addressing SDH among two groups while allowing the investigators to design and administer an IPE experience in a controlled manner (Portney, 2020). Institutional ethics approval was obtained before the analysis of study data.

Participants

Potential participants were invited to participate in the IPE event through an informational e-mail which was distributed to each of the health science programs at two universities in the Midwest region of the U.S. Each department faculty IPE representative provided a list of students who intended to participate to the researchers. Some programs required student participation, while other programs offered it as a voluntary experience. Study participants were graduate and undergraduate students enrolled in 14 health science programs (addiction counseling and prevention, clinical psychology, communication science disorders, dental hygiene, dietetics, health sciences, medical laboratory sciences, medicine, nursing, occupational therapy, pharmacy, physical therapy, physician assistant, and social work) at the two universities. The number of students enrolled per program varied based on the student registration in each program. A power analysis was conducted using G Power. Results indicated that for the number of dependent variables (see Table 4) and with two groups, a total of 279 participants would be required to reach power assuming a small effect size ($d=0.2$), 80% power and statistical significance set at $\alpha = .05$, with a between effect component.

Research Instruments

Demographic information was collected from each participant, including their discipline, number of previous IPE experiences, and perceptions regarding the value of IPE. Two outcome tools were completed at pre and posttest.

The Interprofessional Attitudes Scale

The Interprofessional Attitudes Scale (IPAS) was used to assess attitudes towards interprofessional learning (Norris et al., 2015). It consists of 27 items to which individuals respond by indicating their attitudes towards interprofessional learning on a Likert-type scale which ranged from 1= strongly disagree to 5= strongly agree. The ratings are computed into sub-scales: teamwork, roles, and responsibility; patient-centeredness, interprofessional bias, diversity and ethics; and community centeredness. During instrument development, the IPAS was found to have good internal consistency reliability with values ranging by subscale ($\alpha=.62-.92$; Norris et al., 2015). It has been used extensively to assess the attitudes of interprofessional teams of students following an IPE learning experience (Boland et al., 2018; Gillette et al., 2019; Kim et al., 2019).

Assessment of Social Determinants of Health Questionnaire

A review of the literature revealed no assessments for determining knowledge of the social determinants of health among students. For this reason, the lead author developed an assessment based on an extensive review of literature on SDH and a review of published surveys assessing student learning competencies. The questionnaire consisted of the following sections:

- Section I - Selection of SDH from a provided list.
- Section II - Two items inquiring about social factors that impact health care delivery to each of which the student indicated agreement or disagreement.
- Section III - Eleven questions inquiring about a student's level of knowledge and comfort in addressing SDH during health care delivery which were rated on a 4-point

Likert-type scale with scores ranging from 1= strongly disagree, to 4 = strongly agree with statements about SDH. Ratings from these eleven questions were aggregated to yield an overall score for one variable (knowledge and comfort in addressing social determinants of health). A final item assessed the overall comfort in addressing social determinants of health. This item was anchored at 0 = “not at all comfortable” and 10 = “very comfortable.”

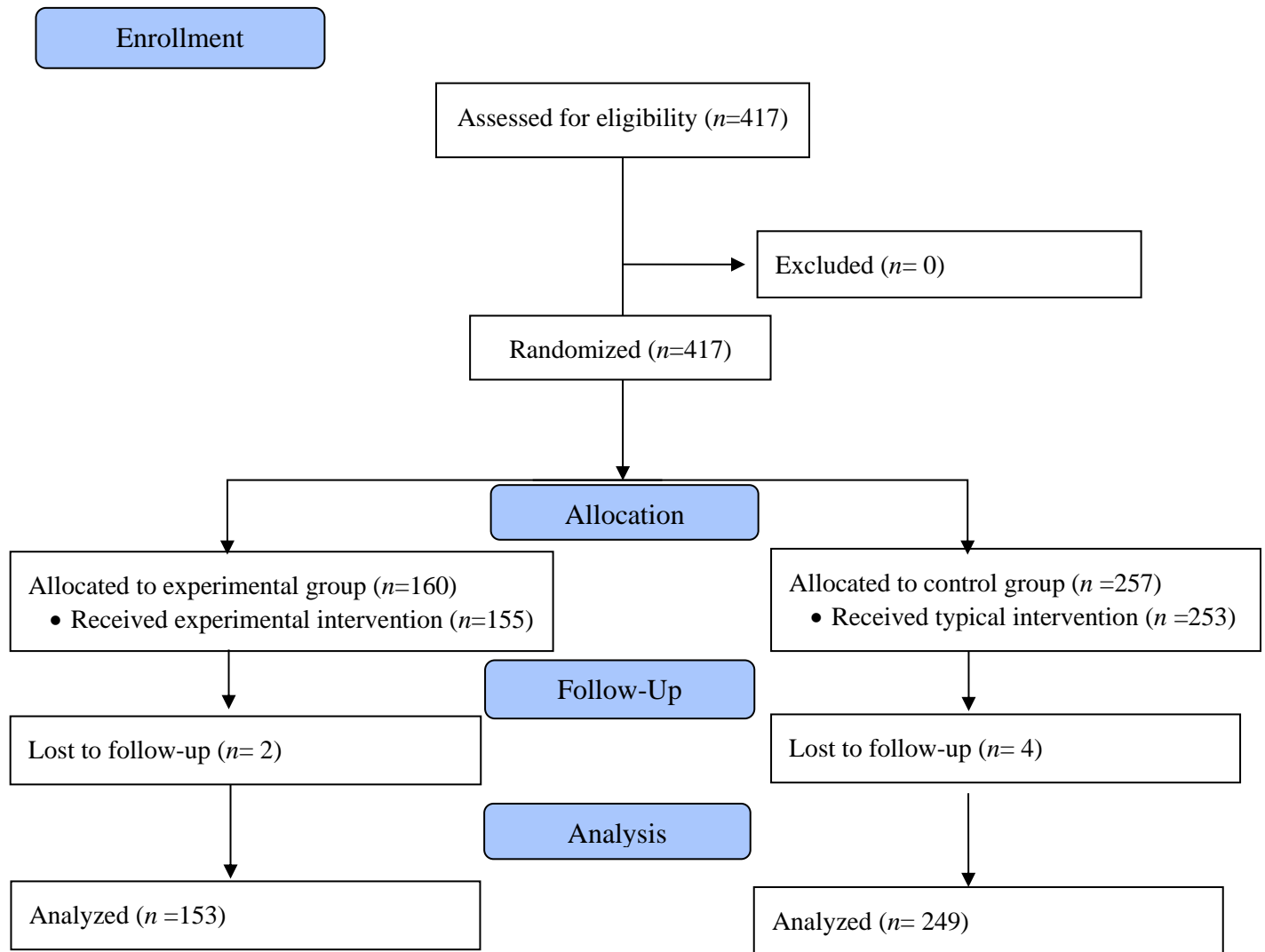
Members of the University’s Interprofessional Health Education Committee (IHEC) were asked to review the questionnaire and offer suggestions for revising items for readability and clarity of content. The internal consistency reliability for the social determinants of health scale was poor at pretest ($\alpha=0.63$) and posttest ($\alpha=0.67$). However, the authors determined it was acceptable for a new instrument that was being piloted for the first time. Cronbach alpha values 0.6 and below are considered questionable, while those above 0.7 are considered to indicate good internal consistency reliability (Portney, 2020).

Procedures

Students in each of the identified health science programs were forwarded an informational e-mail from their department’s IPE faculty representative. The IHEC administrative assistant allocated participants to groups. An effort was made to ensure that groups had student representatives from a variety of health science professions to enable interprofessional collaboration. This was accomplished by listing each student in an Excel spreadsheet and varying enrollment in groups to ensure a range of professions were represented among groups. Each group was then assigned a number, which was randomly selected as either receiving the experimental case study or the control.

Two case studies were used as content for the IPE event. For this event, the experimental case was implemented for the first time, while the control case had been used at the University in previous IPE events. The development of the case study used in the experimental group is in process for publication.

Participants in both groups were provided with the information needed to participate in the IPE event through the online learning platform D2L. Due to the availability of actors to learn the new role of the experimental case study, fewer students were allocated to the experimental group than to the control group. Event organizers were aware of how students were grouped, but students were blinded to group allocation. The participant recruitment procedure is illustrated in Figure 1.

Figure 1*Consort Flow Diagram*

Note. Consort Flow Diagram (Schulz et al., 2010). Participants in the experimental group were provided with a case study emphasizing social determinants of health, while those in the control group were provided an existing case study that was medically based, including less of an emphasis on social factors. Participants that completed the pretest but did not attend the IPE event did not receive the intervention.

The IPE event lasted four hours. Before the event, all participants were invited to respond to the pretest assessments (IPAS and SDH Questionnaire) through a link provided in D2L. The objectives of the IPE event itself were to enable students to:

- Describe other health professionals' roles and responsibilities.
- Participate in clinical decision-making as members of an interprofessional team, accepting input from and valuing contributions by team members at all professional levels and disciplines.
- Demonstrate, through interpersonal interactions with standardized patients and other health care professionals, positive attitudes towards aging, disabilities, and cultures.

On the day of the event, students were assigned group meeting spaces on campus. Each meeting room offered an environment conducive to learning and provided adequate space for team members (groups ranged from 8-12 students). At the start of the event, introductions were required, and team members were instructed to review the case and work collaboratively to address health factors identified in the case description, making recommendations about how each health care discipline would contribute to the treatment of the client.

An overview of the event schedule was posted in D2L (see Table 1). A faculty member, staff, or graduate student from one of the participating health science disciplines served as the standardized patient (actor) who was interviewed by the team of students. Teams were asked to identify five pressing concerns for the subject of the case study as well as five recommendations based on these concerns. Following the role-play, the teams made their recommendations for intervention to address the concerns for the standardized patient and submitted them to the learning management platform before a 20-minute team debriefing. After debriefing with the standardized patient, students were asked to complete posttest assessments (IPAS, SDH Questionnaire).

Table 1*Interprofessional Case Simulation Event Schedule*

Before the IPE Event
<p>Students:</p> <ul style="list-style-type: none"> - Were asked to review recommended materials: Team STEPPS®, Interprofessional Education Collaborative (IPEC) Core Competencies, and had an overview of health professionals who would be present on the day of the event. - Reviewed the schedule, team assignments, and case assignments. - Completed Pre-test.
On the Day of the Event
<p><u>Team Preparation -Students:</u></p> <ul style="list-style-type: none"> - Arrived at the assigned small group room. Introductions were completed. - Determined up to four members of their team to be the interview facilitators. These students were to keep the interview on schedule and ensure all disciplines were involved in decision-making. The facilitators presented the overall findings from team discussions and recommendations to the client. - Reviewed the client chart information. <p><u>Simulation with Standardized Patient - Students:</u></p> <ul style="list-style-type: none"> - Invited the client into the room. Four designated team facilitators interviewed the client, ensuring that key information from all disciplines was represented. - The client left the room. <p><u>Team Collaboration - Students:</u></p> <ul style="list-style-type: none"> - Worked as a team to develop a plan and their care recommendations, completing the Team Recommendation Form. Submitted the form into their group's Dropbox on D2L. - Team members were involved in developing recommendations. <p><u>Debriefing - Students:</u></p> <ul style="list-style-type: none"> - Had team facilitator(s) present the written findings and care recommendations to the client. - Were debriefed by the standardized patient regarding team interactions. The actor provided the team with recommendations for the client based on information provided by faculty from each discipline. - Were encouraged to ask questions during the debriefing session.
After the Case Simulation
<p>Students:</p> <ul style="list-style-type: none"> - Were asked to complete the posttest assessments online.

Data Analysis

Data were analyzed using SPSS for Windows version 25 (IBM Corp, 2017). Exploratory data analysis using descriptive statistics revealed data were approximately normally distributed and met the assumption of equal variances required for conducting a MANOVA. These data were analyzed as follows: A repeated measures MANOVA using within and between-group effects were conducted to determine the main effect of using the experimental case during the IPE event on the students' improvement in knowledge

and awareness about teamwork, roles of various team disciplines, responsibilities of various health care disciplines, patient-centeredness, interprofessional bias, diversity and ethics, community centeredness, and knowledge of the social determinants of health. A paired samples t-test ($\alpha=.05$) was used to determine changes in participants' comfort in addressing SDH which was assessed using the SDH Questionnaire.

Items from the IPAS were collapsed, and analysis was conducted using descriptive statistics for each sub-scale: Teamwork, roles, and responsibilities (9 items), patient-centeredness (5 items), interprofessional biases (3 items), diversity and ethics (4 items), community centeredness (6 items), and SDH (11 items). Students responded to the IPAS and the SDH Questionnaire by indicating on a 4-point Likert-type scale with 1=strongly disagree to 4= strongly agree their agreement with each statement. The 'neutral' category on the IPAS was removed to amplify the responses of agreement and disagreement.

Three variables that were computed on the IPAS, including interprofessional bias and teamwork, roles, and responsibilities, along with one variable from the SDH Questionnaire (social determinants of health), met the assumption of normality. For data that were not evenly distributed a non-parametric Mann Whitney U-test was used. The aggregate scores ranged for each variable from a minimum of 9 to a maximum of 36 (teamwork), 3 to 12 (bias), and 11 to 44 (social determinants of health). A higher score indicated that participants agreed more with the premises of the variable and conversely a lower score indicated less agreement.

Team recommendations submitted by each team on D2L were analyzed using content analysis procedures to identify themes about key concerns and recommendations from the perspectives of the students. Each team's priority was listed on an Excel spreadsheet. Responses were categorized by aligning each response with one of the categories identified by the researchers before the event listed in Table 2. Frequencies with which each category was identified as a priority by the student teams were computed and entered into the SPSS database. A Pearson Chi-Square test of association was used to determine if there was a relationship between group membership (being in experimental versus control group) and the tendency to identify certain categories for intervention.

Table 2

Categories of Social Determinants of Health identified by Student Teams and their Recommendations Regarding How to Address Those Factors

Team Priorities	Team Recommendations
Education	Health Education / Prevention
Environment	Primary Medical Care
Economic & Health Care Access	Mental Health
Food/Nutrition & Physical Exercise	Community Services
Mental / Psychosocial Health	Occupational and/or Physical Engagement
Medical	Cultural Emphasis
Well-being	Health Behavior
Culture	

Results

Four hundred seventeen students registered for the IPE event and 408 participated. Of the participants, 155 were assigned to the experimental group and 253 to the control. Data for 402 participants were analyzed at posttest (153 for experimental and 249 for the control group). Students from 14 medical and health science professions participated in this study (see Table 3 for a breakdown by discipline).

Table 3

Participants Enrollment by Professional Discipline

Discipline	<i>n</i>
Addiction Counseling and Prevention	10
Communication Science Disorders	31
Clinical Psychology	6
Dental Hygiene	31
Dietetics	16
Health Science	2
Medical Laboratory Science	9
Medicine	67
Nursing	56
Occupational Therapy	27
Physical Therapy	32
Physician Assistant	25
Pharmacy	75
Social Work	21

Most of the participants (249) had previously participated in fewer than 10 IPE events. Fifty-one percent of participants (213) indicated having ten or fewer experiences involving working with or learning about clients from diverse backgrounds. Many of the participants (288) indicated they felt that IPE experiences were a valuable use of their educational time.

Participant comfort in addressing the SDH was measured on the SDH Questionnaire (1-10 scale, with 10 indicating the highest level of comfort). Among both groups of participants scores on this questionnaire increased from $M=6.2$ ($SD = 1.7$) at pretest to $M=7.0$ ($SD = 1.6$) after the IPE event, $t(385) = -12.54$, $p < .001$.

A multivariate analysis of variance (MANOVA) revealed no significant main effect of using the experimental case on perceptions of teamwork roles and responsibilities, bias, or social determinants of health $F(2, 368) = 1.9$, $p = .15$; Wilk's $\Lambda = 0.15$, partial $\eta^2 = 0.10$. A post-hoc analysis of variance (ANOVA) using the Bonferroni test indicated a main effect of the IPE event on students' awareness of SDH, $F(1, 364) = 149.6$, $p < .01$; Wilk's $\Lambda = .00$, partial $\eta^2 = 0.29$. Examination of the means indicated that for all groups, the awareness of the social determinants of health improved following participation in the IPE event (see Table 4).

Table 4

Descriptive Statistics for Dependent Variables Among All Participants

	Pre		Post	
	M	SD	M	SD
Community Centeredness	22.6	2.1	22.3	2.1
Diversity and Ethics	19.4	1.2	19.4	1.4
Interprofessional Bias	8.6	1.8	8.6	2.0
Patient Centeredness	19.7	1.0	19.4	1.2
Teamwork, Roles, and Responsibilities	31.8	3.0	32.0	2.9
Social Determinants of Health	34.6	3.5	37.3	4.0

The ANOVA indicated no main effect of using the experimental case on student bias towards other professional disciplines, $F(2, 369) = 5.2$, $p = .23$, $p = .23$ Wilk's $\Lambda = 0.23$, partial $\eta^2 = 0.14$ or reduction of bias towards other professional disciplines, $F(1, 369) = 0.16$, $p = .69$; partial $\eta^2 = 0.00$. There was a main effect of participation in IPE on valuing of teamwork, $F(1, 369) = 4.1$, $p = .044$; partial $\eta^2 = 0.11$, however, the means indicated a time effect only in the experimental group.

For data that did not meet assumptions of parametric statistics, non-parametric testing was used. A Mann Whitney U-test indicated no statistically significant differences between the experimental and control groups on the dependent variables patient centeredness, valuing of diversity, or ethics (see Table 5).

Table 5

Results of Mann Whitney U-test for Patient Centeredness, Diversity and Ethics, and Community Centeredness

Variable		Mean Rank	U	Z	p	r
Pretest						
Patient Centeredness	Experimental	202.6	18970.5	-0.256	0.80	-0.013
	Control	200.8				
Diversity and Ethics	Experimental	199.97	16654.0	-1.165	0.24	-0.060
	Control	189.47				
Community Centeredness	Experimental	201.90	18330.5	-0.374	0.71	-0.019
	Control	198.01				
Posttest						
Patient Centeredness	Experimental	199.53	17163.0	-1.063	0.29	-0.054
	Control	192.22				
Diversity and Ethics	Experimental	194.11	17656.5	-0.178	0.86	-0.009
	Control	195.54				
Community Centeredness	Experimental	198.54	17119.5	-0.642	0.52	-0.033
	Control	192.04				

Note. n=388

Team Recommendations and Priorities

Forty interprofessional student groups were formed. Thirteen of these groups received the intervention and the remaining 27 were the control. Of the groups allocated to the experimental case, 31% prioritized interventions related to socioeconomic status and access to health services as compared to 4% of students in the control groups, $\chi^2(1, N = 40) = 5.9, p = .015$. Pearson χ^2 test of association indicated that participants in the experimental group were more likely to recommend health education than students in the control group, $\chi^2(1, N = 40) = 14.78, p < .001, L_{\chi^2}(1, N=40)=18.43, p < .001, \text{Cramer's } V=.591$. Eleven of the 13 experimental groups (85%) recommended health education. One hundred percent of students in the control groups recommended primary medical care services as compared to 64.5% of students in the experimental group, $\chi^2(1, N = 40) = 9.2, p = 0=.002, L_{\chi^2}(1, N=40)=10.0, p=.002, \text{Cramer's } V=.480$. There was an association between being in the experimental group and the tendency to recommend interventions that included a cultural component, $\chi^2(1, N = 40) = 4.4, p = 0.037, L_{\chi^2}(1, N=40) = 4.7, p=.30, \text{Cramer's } V=0.331$. The priorities for intervention submitted by student groups, along with their recommendations can be seen in Table 6.

Table 6*Team Priorities and Recommendations*

Category	Experimental Group (n = 13)	Control Group (n = 27)
Team Priorities		
	Total Times Prioritized	
Education	1	0
Environment	0	6
Economic & Health Care Access	4	1
Food/Nutrition & Physical Exercise	12	22
Mental / Psychosocial Health	12	32
Medical	29	74
Well-being	1	0
Culture	1	0
Team Recommendations		
	Total Times Recommended	
Health Education / Prevention	14	5
Primary Medical Care	16	73
Mental Health	7	21
Community Services	8	15
Occupational and/or Physical Engagement	5	11
Cultural Emphasis	2	0
Health Behavior	10	11

Note. N=40 (total number of groups)

Discussion

The purpose of this study was to determine if the use of a case study that incorporated SDH content during an IPE event was effective at increasing interprofessional competencies and knowledge of and confidence in addressing SDH among health science students. This was an important investigation because as the complexity of health care increases, students are expected to understand how to effectively manage both medical and social aspects of an individual's care as well as to understand the multifaceted constructs of health and well-being (Cesta, 2018; Sharma et al., 2018; Williams et al., 2016). This need presents a challenge in designing educational experiences that adequately equip students to work collaboratively and confidently in interprofessional teams and to address SDH. This was particularly important for occupational therapy students, as the importance of improving population health and addressing SDH for individuals and groups is of continued priority in the profession (AOTA, 2020; Braveman, 2016).

Although participating in the IPE event increased students' awareness of and comfort with addressing SDH among participants in both groups, the changes from pre-posttest were relatively small. This slight improvement in knowledge of SDH for all students after participation in the IPE event suggests that whether the experimental case study was used or not, knowledge in these factors was improved. It is important to note, however,

that this finding was reached using a newly developed instrument and was achieved with a large sample size. As such, these results should be interpreted as preliminary findings which require replication to increase generalizability. Similar findings have been reported in other studies which found an increase in student confidence and knowledge of SDH following exposure to SDH content including poverty, access to resources, housing, cultural factors, and the built environment (Feldhacker et al., 2021; Ryan et al., 2015; Singh et al., 2019; Snyman & Geldenhuys, 2019). Perhaps exposing students to the SDH, even using the SDH questionnaire alone, was an effective method to increase their knowledge of SDH. For this reason, exposing students to the notion that social, contextual, and physical factors influence health is of importance (Braveman, 2016). The authors anticipate that the SDH Questionnaire used to assess knowledge of the SDH helped students in both groups consider SDH. In addition, because groups contained multiple health professional students from various disciplines, students from disciplines that were more familiar with SDH may have brought forth this knowledge during group discussion. Further, most of the students had engaged in IPE experiences previously. These experiences and classroom learning may have resulted in some prior knowledge of SDH.

No increase was found for the variables of teamwork and professional biases among participants. The authors anticipate that the short duration of the event did not provide adequate opportunity for students to change their perceptions towards either variable. Students may also have been focused on highlighting their specific professional role within the context of health care and focused less on understanding their role in relation to other professionals. Kirkpatrick (2006) suggested that teamwork is a multilevel process, beginning with participation in IPE, advancing to modification of attitudes and knowledge, and finally progressing towards an understanding of the benefits of the information to the patient and society. The process can be viewed as a gradual evolution as students learn and grow in their professional journey. This notion and the short duration of this learning event support the lack of change towards these variables.

The team recommendations resulted in differences based on group enrollment. Students in the experimental group recommended health education, preventative services, and health behavior change for the client depicted in the case study more frequently than did those in the control group. The content of each case study, however, may have contributed to this finding. The study design (lack of qualitative data) and instruments selected to measure variables may not have adequately captured why such differences were observed between groups. Future studies should focus on gathering qualitative data to capture the holistic experiences of participants and the groups' process for working through the case study.

Limitations

A limitation of this study was the unequal distribution of participants to groups. Because a new case study was developed and implemented, the standardized patients acting the case needed to be trained, and the case validity needed to be established. It was therefore not possible to have the same number of standardized patients for each case. Data collected from a single event are difficult to generalize, which limited the external

validity of the findings. As such, the study should be replicated with larger, more geographically diverse participants. The authors recognize that removing the 'neutral' response from the IPAS posed a limitation and since the time of conducting this research, variability in the validity of the IPAS subscales has been reported (King & Violato, 2021; Violato & King 2020). No valid and reliable tool for assessing knowledge of the SDH could be located. Using an author-developed tool limits the interpretability of study findings as psychometric properties were not established.

Implications for Occupational Therapy Education

Differences in health status are observed across groups in society which have resulted in health disparities. Often, these factors relate to SDH. As such, it becomes imperative that occupational therapists have the skillset to understand how SDH influence health and how occupational therapy professions may work to reduce the negative implications of these SDH. Being able to collaborate with an interprofessional team is an important step in this process.

Future research is needed to continue this work to add to the sparse literature on this topic within the profession. This study highlighted that students can gain knowledge of the complexity of health determinants, yet knowledge of policy and systems-level perspectives is a necessary next step through IPE experiences. Assessment tools that capture the knowledge of the SDH are critically needed, especially those which emphasize the ability to engage in meaningful occupation as a determinant of health. Future research should be aimed at developing and testing such instruments for use with students in occupational therapy to expand opportunities in practice, policy development, and advocacy.

Conclusion

Social determinants of health and lifestyle factors account for most of a person's health status. Health professionals must work collaboratively to manage these multiple factors. The purpose of this study was to determine if the use of a case study that incorporated SDH content during an IPE event was effective at increasing interprofessional competencies and knowledge of and confidence in addressing SDH among health science students. Results indicated that the content of the new case did not produce a significant difference in student knowledge based on group enrollment. Knowledge of the SDH, however, did increase for those in both groups.

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