ORIGINAL RESEARCH

Cultural awareness immersion and introduction to social determinants of health: The 360-degree difference

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ABSTRACT

Background and objectives: To address the need for innovative educational activities which focus on the Asian American population, and focuses on the Social Determinants of Health (SDOH) and culturally competent care, an immersive, interactive 360-degree video simulation-based educational activity (SBE) was implemented by nursing faculty at a Midwest university. The specific aims of the project were to a) assess changes in participants knowledge and skills as related to SDOH, cultural awareness, and health literacy with the Asian American population; b) participant confidence, and c) assess the usefulness, and ease of use, of 360-degree video simulation.
Methods: A single group pretest-posttest design was used in this SBE activity with a convenience sample of 83 undergraduate baccalaureate nursing students at one university.
Results: The SBE activity improved overall knowledge and confidence. Furthermore, the majority of participants perceived the SBE activity as useful and that the 360-degree video technology was easy to use.
Conclusions: The results contribute to limited literature exploring outcomes of 360-degree video simulation with a focus on the Asian American population and SDOH, cultural competence, and health literacy. Implementing such SBE activities into nursing curriculums is critical to address health disparities and increase knowledge and skill in clinical practice for undergraduate nursing students when serving vulnerable and underrepresented populations.

Key Words: Simulation-based education, Social determinants of health, Cultural awareness, Health literacy, Underserved populations

1. INTRODUCTION

Simulation based learning in nursing education has expanded throughout the years to enhance skills in a variety of domains, including self-efficacy and decision-making skills.[1,2] Engaging students in clinical scenarios through simulation may help them develop clinical competence, even prior to actual client care experiences.[3] Furthermore, simulation-based learning is noted to be essential in a students' preparation and learning for practice.[4] One recent innovation in simulation is the use of 360-degree video technology to create virtually authentic learning environments.[5] 360-degree videos allow users to look around in all directions by capturing a panoramic view using a 360-degree camera.[6] Previous research has identified a positive learning experience with

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360-degree videos, including high levels of interest and engagement and perceptions that the experience is beneficial.[7] Utilizing 360-degree video simulations in nursing education could benefit nursing students as a way to enhance their skills while providing a positive learning experience.

One clinical area that would benefit from the use of 360-degree videos for simulation is content related to Social Determinants of Health (SDOH), as there is a gap in nursing education in understanding the influence of SDOH on client outcomes.[8] SDOH are conditions in the environment that affect a wide range of health outcomes and can be grouped into five domains of economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context.[9] The National League for Nursing[10] calls for the SDOH to be integrated throughout undergraduate nursing courses. Therefore, identifying and implementing tools to integrate SDOH content in undergraduate nursing courses is imperative.

Another important concept that is being integrated in nursing courses is cultural competence. Cultural competence is the attitudes, knowledge, and skills necessary for providing quality care for diverse populations.[11] The American Association of Colleges of Nursing (AACN) calls for integration of cultural competence in nursing courses to support the development of client-centered care and reduce health disparities.[12] Simulation can be a helpful tool to enhance understanding of SDOH and culture.[13] To address the need for an innovative simulation-based educational (SBE) activity that addresses the SDOH and culturally competent care, an immersive, interactive 360-degree video intervention was developed by nursing faculty at a Midwest university and implemented in the fundamentals in nursing course.

The purpose of this project was to evaluate student learning outcomes of the SBE activity. The specific aims of the project were to a) assess changes in knowledge and skills as related to SDOH, cultural awareness, and health literacy with the Asian American population; b) participant confidence, and c) assess the usefulness, and ease of use, of 360-degree video simulation.

1.1 Conceptual framework

The SBE activity was guided by the International Association of Clinical Simulation's Learning Standards of Best Practice Simulation (INACSL) in that the simulation was purposefully designed and implemented to meet identified objectives and optimize achievement of expected outcomes. A YouTube prebrief was created and shared with students prior to the SBE activity. Prebriefing included a review of simulation principles and a review of learning outcomes to help prepare participants and ensure psychological safety of participants. The 360-degree video simulation was a self-paced activity that was designed with interactive and immersive features with built-in cues to assist participants in achieving desired outcomes. Participants were presented information and facts with a focus on the Asian American population during the SBE activity. A group debrief (6-8 participants) was led by clinical lab faculty in the nursing skills laboratory immediately following completion of the 360-degree video.

According to the INASCL Standards Committee, the goal of debriefing is to assist in the development of insights, improve future performance, and promote the integration of learning to practice.[14] A debrief template was used to guide the debriefing process and included simulation objectives, a reaction phase, an analysis phase, a consolidation/reflection phase. Facilitators were asked to give participants a few minutes to re-read objectives, and then pause and allow participants to express any emotions or initial reactions to the scenario first. Questions such as the following were used during this phase: How did the simulated experience make you feel?, What went well in the scenario?, Reflecting on the scenario, were there any actions you would do differently if you were to repeat this scenario?, and If so, how would your patient care or communication change?

Analysis phase questions were linked directly to the objectives and included questions related to communication, cultural awareness, SDOH, and health literacy. In closing, facilitators were asked to have participants note how they could apply the knowledge acquired through this experience to real patients and to share one take-a-way from the experience. As noted by the INASCL Standards Committee,[14] key components of a debrief include feedback, debriefing, and reflection and the SBE debrief used followed the criteria to meet this standard.

2. METHODS

2.1 Research design, setting, and sample

The SBE activity was used as the intervention in the study to assess the impact the 360-degree video simulation had on the students' knowledge and confidence with SDOH, cultural awareness, and health literacy with the Asian American population. A single-group pretest-posttest design was used for this study. The study sample consisted of first year, second semester nursing students enrolled in a baccalaureate nursing program at a Midwest university in the United States, during week 13 of the winter 2022 semester. Students in this cohort had didactic content regarding culture awareness, completed at minimum 90-hours of direct client care, and completed laboratory skills in a fundamental of nursing course, but had limited didactic content in relation to the SDOH. The SBE

activity was embedded into the syllabus as a learning exercise for all students to complete in the course. All students in the course were invited to participate in the study (N = 102). Regardless of consent to participate in the study, students had to complete the SBE activity. Participation in the study was anonymous and voluntary, and students could withdraw at any time without consequences. Eighty-three students consented to the study and completed an online informed consent prior to the online pretest and posttest in the winter 2022 semester. Data analysis occurred after final grades were posted. The researchers were not involved in the administration and facilitation of the SME activity (intervention) or data collection as to avoid coercion. Demographic data was not collected due to the group being homogenous. Research began after Institutional Review Board (IRB) approval.

2.2 Instruments

The study instrument included pre-and post-surveys. The pre-survey had three sections: 1) a 2-item preparation scale (5-point Likert scale) that examined students' perception of impacts of the pre-briefing on their preparation for the simulation and if pre-briefing was beneficial to learning (Cronbach's α =.76), 2) a10-item knowledge and skills scale (10-point Likert scale) examined students' knowledge and skill of working with vulnerable populations, identifying and applying domains of SDOH, applying cultural awareness and culturally competent care, identifying barriers to care, and locating services and preventive care programs in the community, and 3) an 8-item confidence scale (5-point Likert scale) that examined students confidence in clinical decision making, prioritizing care, culturally competent care, communication, and identifying resources. The posttest survey had five sections: 1) a 5-item debriefing scale that examined students' perception to how the debrief contributed to their learning, and opportunities for self-reflection (Cronbach's α =.93), 2) a 10-item knowledge and skills scale (10-point Likert scale; Cronbach's α =.95), 3) an 8-item confidence scale (5-point Likert scale; Cronbach's α =.94), 4) a 7-item perceived usefulness scale (PU) (5-point Likert scale) that examined students' perception related to how useful the simulation was in enhancing clinical decision making, improving the overall clinical experience, providing information that was not previously provided, and whether the information was helpful and consistent (Cronbach's α =.90), and 5) a 7-item perceived ease of use scale (PEOU) (5-point Likert scale) that examined students' perception related to the 360-degree video being easy to use and video quality indicators such as audio, pace, resolution, and clarity of scenes (Cronbach's α =.85). The PU and PEOU scales were based on the constructs validated by the Technology Acceptance Model (TAM)[15, 16] and adapted to the context of this study. All measures in this study showed good to excellent levels of reliability as Cronbach's alpha was used to address reliability concerns for internal consistency. Constructs are considered to have internal consistency reliability when the Cronbach's alpha exceeds 0.70.

2.3 Data analysis

Data were analyzed using SPSS version 28. Descriptive statistics were used to summarize the data, and paired *t*-tests were used to compare pretest and post-test results for the knowledge and skills scale and the confidence scale.

3. RESULTS

3.1 Preparation survey

For the pre-brief survey, the following percentages represent the agree and strongly agree responses: 66% of students believed the pre-brief increased their preparation for the simulation (mean score of 3.85/5) while 64% felt the pre-brief was beneficial to their learning (mean score of 3.76/5). The data analysis shows that the majority of respondents appeared to have felt prepared for the SBE activity as well as finding the pre-brief to be beneficial to their learning.

3.2 Knowledge and skills survey

For the knowledge and skills survey, the posttest mean score was 8.22/10, indicating a fairly high level of growth in knowledge and skills. All questions scored with means between 8.02 and 8.57 except for one question that had a mean of 7.86. This question was centered on the student's ability to locate social services and preventive health programs for clients.

Paired sample *t*-tests were run on the knowledge and skills survey. Eight of the 10 questions were statistically significant ($p < .01$) (see Table 1). The results showed that students had growth in the following: comfort level working with vulnerable populations, identifying how SDOH impact a client, applying specific domains of SDOH to client health needs, bringing cultural awareness through identifying individual and environmental strengths and challenges, identifying barriers clients face from underserved communities, analyzing environmental impacts to a client health outcomes and quality of life, developing nursing interventions to reduce client barriers to accessing healthcare, and locating social services and preventative health programs.

Table 1. Knowledge and skills scale paired samples test

Question	No.	Mean (SD)	t(df)	One-sided *p* (Two-sided *p*)
Comfort level working with vulnerable populations in the future.	83	-8.55 (2.067)	-3.771 (82)	*< .001 *(< .001)
Pre	83	7.22		
Post	83	8.07		
Identifying how the social determinants of health (SDOH) domains impact a client.	83	-1.518 (2.365)	-5.874 (82)	*< .001 *(< .001)
Pre	83	6.67		
Post	83	8.19		
Applying specific domain of SDOH to client's health needs.	83	-1.578 (2.322)	-6.192 (82)	*< .001 *(< .001)
Pre	83	6.48		
Post	83	8.06		
Bringing cultural awareness through identifying individual and environmental strengths and challenges.	83	-.783 (1.951)	-3.657 (82)	*< .001 *(< .001)
Pre	83	7.55		
Post	83	8.34		
Identifying multi-level barriers (e.g. educational attainment, language barriers, and health literacy) that clients face from underserved communities.	83	-.904 (1.764)	-4.666 (82)	*< .001 *(< .001)
Pre	83	7.65		
Post	83	8.55		
Analyzing how environment impacts client health outcomes and quality of life.	83	-6.27 (1.716)	-3.326 (82)	*< .001 *(.001)
Pre	83	7.94		
Post	83	8.57		
Developing nursing interventions to reduce clients' barriers for accessing healthcare.	83	-1.012 (2.266)	-4.069 (82)	*< .001 *(< .001)
Pre	83	7.01		
Post	83	8.02		
Finding positive factors and support systems for clients.	83	-.663 (2.313)	-2.610 (82)	*.005 *(.011)
Pre	83	7.41		
Post	83	8.07		
Locating social services and preventive health programs for clients.	83	-1.181 (2.440)	-4.408 (82)	*< .001 *(< .001)
Pre	83	6.67		
Post	83	7.86		
Providing culturally-competent care for clients.	83	-.542 (1.856)	-2.661 (82)	*.005 *(.009)
Pre	83	7.99		
Post	83	8.53		

**Note*. Statistically significant $p < .05$

3.3 Confidence survey

For the confidence survey, the posttest mean score was 4.017/5.0, indicating a fairly high level of confidence regarding learning gained from the 360-degree simulation. The lowest scoring items on the instrument were the questions regarding the students' confidence in their ability to locate resources for clients with a mean of 3.88 and the students' clinical decision-making skills with a mean of 3.96.

Paired sample *t*-tests were run on the confidence survey. Six of the 8 questions were statistically significant ($p < .05$) indicating increased confidence (see Table 2). Those included the question regarding a student's confidence to make timely clinical decisions, a student's confidence about clinical decision-making skills, and a student's confidence in being able to teach clients.

3.4 Perceived usefulness (PU) survey

For the PU survey, the following percentages represent the agree and strongly agree responses: 87% noted that the content on cultural communication was appropriate, 95% noted

that the content in the 360-degree was easy to understand, 87% noted that the content in 360-degree was helpful, 95% noted that the content in 360-degree was consistent throughout the simulation, 77% noted the 360-degree video enhances clinical skills, 74% noted that the 360-degree video improves the overall clinical experience, and 74% noted that the 360-degree video gave information that the student did not have before. The mean score for all questions ranged from 4.01/5 to 4.45/5, indicating that the majority of respondents appeared to feel the SBE activity was useful in the areas assessed. The lowest two mean scores of 4.01 were questions that related to the simulation improving the overall clinical experience and the simulation providing the student with information that they did not have before.

Table 2. Confidence scale paired sample *t*-test results of pre-and post-test scores

Question	No.	Mean (SD)	t(df)	One-sided *p* (Two-sided *p*)
To make timely clinical decisions.	83	-.386 (1.080)		
Pre	83	3.61	-3.252 (82)	*< .001
Post	83	4.00		*(< .002)
About my clinical decision-making skills.	83	-5.06 (1.005)		
Pre	83	3.46	-4.589 (82)	*< .001
Post	83	3.96		*(< .001)
In my ability to prioritize care and interventions.	83	-.277 (1.172)		
Pre	83	3.78	-2.154 (82)	*.017
Post	83	4.06		*(.034)
In communicating with my clients from diverse populations.	83	-1.08 (1.307)		
Pre	83	3.95	-.756 (82)	.226
Post	83	4.06		(.452)
In my ability to locate resources for my clients.	83	-.458 (1.382)		
Pre	83	3.42	-3.018 (82)	*.002
Post	83	3.88		*(.003)
In my ability to effectively teach my clients.	83	-.470 (1.172)		
Pre	83	3.48	-3.652 (82)	*<.001
Post	83	3.95		*(< .001)
In providing interventions that foster client safety.	83	-.157 (1.110)		
Pre	83	3.94	-1.286 (82)	.101
Post	83	4.10		(.202)
In using evidence-based practice to provide culturally-competent nursing care.	83	-.349 (1.098)		
Pre	83	3.81	-2.899 (82)	*.002
Post	83	4.16		*(.005)

**Note.* Statistically significant $p < .05$

3.5 Perceived ease of use (PEOU) survey

For the PEOU survey, the following percentages represent the agree and strongly agree responses: 93% noted that the 360-degree video was simple and easy to use, 75% noted that they wanted to continue learning with related content, 93% noted that in each phase/scene it was clear what to do next, 93% noted that it was easy to operate the devices (pop-up box for 360-degree videos), 73% noted that the 360 degree video had good quality with high resolution, 87% noted that the pace of the 360-degree video simulation program was good, and 89% noted the audio quality was good. The mean score for all questions ranged from 3.95/5 to 4.48/5, indicating the majority of respondents appeared to feel the SBE activity was useful in the areas assessed. The lowest two mean scores were 3.98 and 3.95 respectfully, and those questions were in regard to whether the student wanted to continue learning with related content and the quality resolution of the 360-degree video.

3.6 Debriefing survey

For the debriefing survey, the following percentages represent the agree and strongly agree responses: 89% noted that debriefing contributed to their learning, 81% reported debriefing allowed them to verbalize their feelings before focusing on the scenario, 85% felt debriefing was valuable in helping to improve clinical judgment, 87% felt that debriefing

provided opportunities to self-reflect on their performance during simulation, and 90% felt debriefing was a constructive evaluation of the simulation. The mean score for all questions was 4.265/5, indicating the majority of respondents appeared to feel the debriefing was valuable to their learning. The lowest mean score was 4.18 and this was in regard to the question on if debriefing allowed the student to verbalize feelings before focusing on the scenario.

4. Discussion

Nurses are in a unique position to identify and address factors related to the SDOH which impact client outcomes and access to care. Not only does the SDOH impact one's health, but it also has impacts on clients overall well-being and quality of life. Results of the current study showed that there were statistically significant increases in knowledge and skills related to the SDOH, cultural awareness, and health literacy after engaging in the SBE activity. Of importance, the first-year nursing students were able to have growth in knowledge and skill acquisition in identifying how SDOH could impact Asian American clients, applying domains of SDOH to the health needs of the client, identifying barriers underserved populations face, and applying the nursing process to the client scenario. The two questions that were not found to be statistically significant did show an increase in mean scores between pre and posttest. The first question centered on the student's ability to find positive factors and support systems for the client. The other question was providing culturally competent care. The client was Bangladeshi with Muslim beliefs which may have been the first encounter with this population for students, both from a didactic and clinical stand point. Aspects of cultural awareness and care were specific to this population throughout the simulation. The SBE answers a call from the NLN to integrate SDOH in undergraduate nursing courses and AACN's call to integrate cultural competence in nursing courses.

Throughout the simulation students were presented statistical and factual data regarding the SDOH domains. Integrating SDOH data into nursing workflows has the potential to improve client care.[17] This simulation brought the data to the forefront while debriefing allowed students to reflect on the scenario and discuss ways in which the new knowledge could be integrated into the client care workflow. Furthermore, the current study answers a call to expand on opportunities to better educate nurses in understanding the connections between the SDOH and challenges clients face.[13] Mean scores on all items in the confidence scale increased between pre and posttest. Of importance is the fact that the statistically significant increases were noted in critical areas such as clinical decision making, evidence-based practice, and teaching clients. Since clinical decision making is an essential area of learning and professional practice, the SBE activity may have been of benefit in these areas. Results from another study[18] showed that practicing nurses noted the SDOH clients' experience creates challenges for the nurse to provide care at the client's level as well as being able to provide the client with usable education. In the current study, the simulation allowed students to immerse themselves in the client environment through 360-degree video reality and build knowledge regarding health disparities while being exposed to evidence-based educational teaching tools available to treat chronic disease, such as hypertension, in the Asian American population.

Overall, the majority of respondents appeared to feel the pre-brief and debrief were valuable to their learning, and the SBE activity was useful and easy to use. The pre-brief ratings were the lowest and may indicate a need for minor revisions, especially with the changing focus on the equal importance of a pre-briefing and debriefing. The lowest rating for debriefing was centered around the student being able to verbalize their feelings before focusing on the scenario. This may have been impacted by the fact that five different lab instructors facilitated the debriefing, and while a debriefing template and some training were provided, none of the lab instructors had formal training in simulation. In addition, this was the first time the simulation was used as an educational intervention.

Limitations

The study was used at one university with a convenience sample which limits generalizability. Future research would benefit from implementing this study at multiple sites with baccalaureate and associate degree nursing students alike. In addition, a self-report questionnaire was used so responses may be subjective. Lastly, this is the first data collected on a full cohort of students; thus, there was no comparison group to strengthen study findings. Nevertheless, the significant increases in pretest and posttest scores suggest the SBE activity increased the knowledge acquisition and skill of participants in caring for the Asian American population, SDOH, cultural awareness, health literacy, and improved confidence.

5. Conclusions

With limited clinical faculty and clinical site placements, nursing education is being called upon to develop and implement robust simulation programs. The National Council of State Boards of Nursing[19] has noted that simulation produces comparable results to actual clinical experiences. Furthermore, the use of virtual simulation must become a part of the overall simulation program.[20] While the School of Nursing currently utilizes both high and low-fidelity simula-

tion in the undergraduate program, use of virtual 360-degree simulation is in its infancy stage. Similar to findings noted in a scoping review,[21] students found the 360-degree simulation to be an effective learning activity to gain knowledge and skill in regards to the SDOH and cultural awareness. Furthermore, students positively perceived the simulation as useful and easy to use. Given that up to 80% of a person's health is determined by socioeconomic factors, health-related behaviors, and environmental conditions,[22] it is imperative to integrate this information in nursing courses. The results of this study highlight that a 360-degree video simulation is a useful tool for integration of SDOH and cultural competence content in nursing courses.

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AUTHORS CONTRIBUTIONS

Dr. Pauli, Dr. Hughesdon, and Dr. Wu were responsible for study design. Dr. Pauli was responsible for data collection and analysis. Dr. Pauli and Dr. Hughesdon worked collaboratively to draft the manuscript and Dr. Wu contributed to revisions. All authors read and approved the final manuscript. Authorship was agreed upon based on contributions in the study.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

INFORMED CONSENT

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

DATA SHARING STATEMENT

No additional data are available.

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