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Assessing baccalaureate nursing students' knowledge and attitudes of social determinants of health after a health equity simulation

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Abstract

Objective: For nursing students, competency in population health management involves acquiring knowledge and forming attitudes about the impact of the social determinants of health (SDoH) on health equity. The purpose of this pilot study was to assess nursing students' knowledge and attitudes about the SDoH and health equity following a focused simulation activity.

Method: Baccalaureate nursing students (N=182) participated in a ninety-minute health equity simulation and a post-simulation debrief. Forty-four students (23%) completed a 19-item post-simulation survey.

Results: Sixty-four percent of participants reported positive attitude change in working with marginalized populations caused by the SDoH, and 89% reported being knowledgeable about the role of the registered nurse in addressing health equity. Seventy-five percent reported enhanced knowledge of the SDoH through the health equity simulation.

Conclusion: Using health equity simulation may be effective in enhancing students' knowledge, as well as their attitudes in caring for the health of marginalized populations by addressing the SDoH.

Keywords: health equity; nursing; poverty; primary care; public health; simulation; social determinants of health.

During the last 25 years, there has been a lack of progress on achieving health equity (Zimmerman & Anderson, 2019). Mortality rates of adults with low education attainment remained unchanged or worsened since 1980s in 17 Southern and Midwestern states in the United States (Montez et al., 2019). Globally, life expectancy significantly vary across countries. For instance, in 1995 a child born in Indonesia could expect to live for 65 years compared to 79.6 years for a child born in Japan, a gap of 14.6 years (Roser, Ortiz-Ospina, & Ritchie, 2019). In 2015, the life expectancy at birth for a child born in Indonesia increased to 69.1 years, but the gap with that of a child born in Japan remained roughly 14.8 years (Roser et al. 2019). Associated factors contributing to the health inequities include a variety of social and economic factors such as income, education, employment, community safety, and social supports (Humowiecki et al., 2018; Sohn et al., 2018). As graduates of baccalaureate nursing programs enter the workforce, they must be prepared to care for all individuals and families across the spectrum of complex health and social needs, while understanding the

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role health equity plays in the attainment of health and wellness. Therefore, it is pertinent that nurse educators seek to expand their students' worldview beyond classroom settings and into the demographics of individuals and communities they will eventually care for.

Health equity has been defined by the World Health Organization (WHO) as “the absence of avoidable, unfair, or remediable differences among groups of people” (WHO, n.d.), while social determinants of health (SDoH) have been conceptualized as “the conditions in which people are born, grow, work, live, age, and the wider set of forces and systems shaping the conditions of daily life” (WHO, n.d.). Over the past 30 years, substantial evidence has been generated to conclude that SDoH significantly influence health and wellness of people (Daniel, Bornstein, & Kane, 2018). Due to the interrelated nature of health equity and SDoH and their impact within healthcare, it is important for nursing curricula to leverage teaching-learning strategies to experience the influence of health equity and SDoH upon patients. To do this, action-based approaches like simulation are critical to help students acquire knowledge and develop skills related to the impacts of health equity and SDoH upon individuals who have been marginalized with complex health and social needs.

Literature review

The use of simulation in nursing education can create a safe space for students to explore and potentially increase their understanding of the relationship between SDoH and health equity. However, to date, the focus of most SDoH simulations in nursing education have been on aspects of poverty and its detrimental impact on health. Reid and Evanson (2016) evaluated available poverty simulation tools including classroom scenarios such as the Community Action Poverty Simulation (CAPS). CAPS, developed by the Missouri Association for Community Action (www.communityaction.org), appeared to be one of the most utilized poverty simulation approaches described in the literature (Reid & Evanson, 2016). Other researchers have evaluated the effectiveness of the CAPS. Patterson and Hulton (2012) examined the effects of a poverty simulation in 43 senior undergraduate nursing students using a pre- post-test design using the *Attitudes Towards Poverty* (ATP) Short Form. The simulation evaluation demonstrated that there were statistically significant positive improvements around stigma (Patterson & Hulton, 2012). A second study conducted a CAPS with 103 baccalaureate nursing students and a control group of 75 students (Noone, Sideras, Gubrud-Howe, Voss, & Mathews, 2012). Noone et al. (2012) administered the ATP survey before the simulation and six weeks after the simulation. Students in the study who participated in the CAPS had significantly more positive attitudes toward people experiencing poverty post than those who did not participate in the simulation (Noone et al., 2012). The researchers reported that it is unknown if the attitudinal change at six weeks in the experimental group was sustained. A third study evaluated the effectiveness of the CAPS in nursing students across three cohorts of 233 students (199 completed surveys) to evaluate CAPS impact in increasing the understanding of attitudes towards poverty and changes in clinical practice (Yang, Woome, Agbemenu, & Williams, 2014). Students completed the ATP short form immediately after the CAPS and six weeks after the simulation. Results demonstrated significant change in attitudes toward poverty in the positive direction. Other researchers applying CAPS found that nursing students' increased understanding allowed them to become more understanding, nonjudgmental, empathetic, and compassionate (Loomis & De Natale, 2017). Finally, Turk and Colbert (2018) found that nursing students felt that CAPS simulation helped them become more involved in the scenario and that they possessed greater empathy for the difficulties faced by the simulation subjects (Turk & Colbert, 2018). Overall, researchers found that CAPS (a) provided nursing students with an increased understanding of the link between poverty and poor health outcomes (Noone et al., 2012); (b) supported lifelong learning about the causes and effect of poverty and propelled students toward civic engagement (Patterson & Hulton, 2012); and, (c) increased nursing students' ability to collaborate with and make referrals to the proper community agencies (Yang et al. 2014).

While CAPS was the most often utilized simulation approach, CAPS' singular focus on poverty is a limitation. While poverty is important, nursing students need to broaden their perspectives related to the

multidimensional nature of health equity, including the intersectional nature of environmental, cultural, race, and gender bias factors that influence health (Avant & Gillespie, 2019; Sharma, Pinto, & Kumagai, 2018). Due to the paucity of literature on simulation and teaching the association of the SDoH and health equity in baccalaureate nursing curriculum, the primary aim of this pilot study was to assess the systematic implementation of a SDoH simulation on students' knowledge and attitudes about the impact of the SDoH on health equity. A secondary aim was to evaluate whether the health equity simulation was beneficial toward student learning.

Description of the simulation

The purpose of the health equity simulation was to improve students' knowledge, skills, and attitudes toward providing interventions that support health equity. The project team of nursing faculty adapted resources from the Health Equity Simulation designed by the Wake Forest School of Medicine. Recognizing the need to include social determinants of health and health equity content in the medical curriculum, a team of medical faculty at Wake Forest designed the Health Equity Simulation, using aspects of real patient cases that they have seen overtime to build fictional patient scenarios (N. Denizard-Thompson, personal communication, July 1, 2020). The simulation has been implemented in the medical curriculum at the Wake Forest School of Medicine, as well at an interdisciplinary training for healthcare and social services professionals in the region.

Students were grouped into simulated families including one to five family members. There were 10 different family scenarios, illustrating various groups that have been marginalized as a result of age, race, gender identity, educational attainment, immigration status, income status, and other social factors. The families included: (a) a three-generation family of five immigrants from Mexico with ages ranging from 10 to 78, facing various chronic illnesses and a catastrophic work-related injury; (b) a 51-year old Caucasian male who became uninsured and homeless after a job loss and divorce, with chronic stress and untreated health issues; (c) an African American Vietnam War veteran with post-traumatic stress disorder and experiencing homelessness; (d) a young Syrian refugee family with a baby and a surprise pregnancy; (e) a gay Caucasian couple without health insurance in their fifties caring for a one-year-old grandchild and experiencing gender discrimination and implicit bias; (f) a second generation Vietnamese American family of four with a gay teenage son, facing a catastrophic accident while on a high deductible insurance plan; (g) an older adult, retired Caucasian couple on fixed incomes navigating Medicare and dementia caregiver issues; (h) a middle-age African American couple with a pregnant teenage daughter experiencing implicit bias; (i) a Caucasian widower with two young children and a new diagnosis of deep vein thrombosis and pulmonary embolism; and, (j) a physician couple with higher income and teenage children experiencing unplanned career-altering pregnancy, emergency surgery, and macroaggression due to their Hispanic ethnicity. Each student took on the role of a family member forced to navigate different social and health challenges, such as having to go to the emergency room, navigating public transit to arrive at a free clinic, trying to get one's prescription filled without having insurance, or getting arrested as a person who is undocumented. Specific instructions were given to each student, that they had to follow to get their character the health and social services they needed.

The health and social services were set up as *stations*, manned by volunteer faculty and former students recruited by the course faculty. There were 13 stations, including (a) Transportation; (b) Doctor's Office/Clinic; (c) Emergency Room; (d) Work; (e) Urgent Care; (f) Social Services; (g) Police; (h) Grocery Store; (i) Medical Supplies; (j) School; (k) Volunteer Services; (l) Travel Agency; and, (m) Pharmacy. Depending on the simulated week, each student was instructed to visit one to three stations. When students visited the stations, wearing their character's name badge, the volunteers provided the students with further information appropriate for the characters, including barriers to obtaining health services, resources that students could research further using their phone, and reflection prompts regarding SDoH and equity so that they could share with their simulated families at the end of the simulated week.

While the original simulation was designed for a 3-h period, the nursing faculty team reduced the number of scenarios to account for the 2-h class assigned for the simulation (1 h) and debrief (1 h). Other than reducing the number of scenarios, the materials were not altered. Overall, the educational outcomes assessed in this health equity simulation included: (a) student attitudes related to working with and providing resources for populations that have been marginalized that are at risk of health inequity; (b) student knowledge of healthcare barriers facing people from communities that have been marginalized; and, (c) student attitudes related to the importance of awareness of healthcare barriers.

Methods

Setting and sample

The setting was a pre-licensure, baccalaureate nursing program at a private university in the Southeastern United States. The simulation was conducted twice for baccalaureate nursing students in two sections of the *Population Health: Community and Public Health Nursing* course offered in the second semester of junior year. A total of 182 students completed a role play.

Ethical considerations

The educational evaluation was reviewed by the University's Institutional Review Board (IRB) and deemed exempt. Participation in completing the evaluation questionnaires was voluntary.

Design

The project was implemented in the spring of 2019 and members of the project team included two course faculty providing oversight and debriefing to the simulation and eight volunteers serving at service stations. A mixed methods evaluation design was used and included a voluntary post-simulation survey (quantitative) to assess students' knowledge and attitudes of the health equity simulation and a required post-simulation debrief (qualitative) to assess whether the health equity simulation was beneficial for student learning. A total of 44 completed surveys (23% response rate) were obtained from the 182 students who participated in the simulation. No overt theoretical lens was used to guide the pilot study.

Data collection

After each simulation, both class sections engaged in separate debrief session during which students had the opportunity to describe their experience during the simulation. The instructor constructed a set of semi-structured debrief questions to pose to the class. Students were invited to answer questions about the simulation experience, such as "what did you learn about the life experience of families with lower incomes?," "how was the experience different from what you expected?," "what were some situations you had?," "in terms of social determinants of health, what can you draw from this experience?," The post-simulation debrief sessions invited students to consider some of the different barriers to care that were present and how social determinants of health influenced individuals and families.

Instruments

Students were asked to complete a post-simulation survey consisting of three demographic questions and 16 Likert-scale questions, with responses ranging from strongly disagree (1) to strongly agree (5), measuring the students' attitudes (three questions); knowledge (six questions); and, opinions on the format of the simulation (seven questions)(see Table 1). The survey also included a question to confirm consent in the simulation. Additionally, one open-ended question was included to provide students the opportunity to generate ideas to improve the simulation.

The survey's content validity was established using an iterative process for item generation among a team of three subject matter experts in nursing and public health. The authors evaluated internal reliability of the survey using Cronbach's α , which was 0.82 for the student attitudes items and 0.96 for the knowledge items.

Table 1: Post-simulation survey questions.

Survey questions (likert scale)
1) Because of the Health Equity Simulation, I now feel more positive about working with vulnerable populations in the future.
2) After experiencing the simulation, I believe nurses should have a role in providing resources to vulnerable populations.
3) Because of the Health Equity Simulation, I believe nurses can play important roles in creating health equity.
4) The Health Equity Simulation has enhanced my awareness of vulnerable populations.
5) The Health Equity Simulation has enhanced my awareness of social determinants of health.
6) After experiencing the simulation, I have a better understanding that health is influenced by more than health care.
7) After experiencing the simulation, I have a better understanding that health is affected by more than personal behaviors.
8) After experiencing the simulation, I have better knowledge of how social factors influence health.
9) After experiencing the simulation, I have a better understanding of how economic factors influence health.
10) The teaching methods employed in the Health Equity Simulation were effective.
11) The volume of information in the Health Equity Simulation was appropriate for the time allotted.
12) The information presented in the Health Equity Simulation was appropriate for my level of training.
13) I was given enough time to complete each of the different family scenarios.
14) The group size was conducive to my learning experience.
15) I would recommend use of the Health Equity Simulation in the future.
16) Additional comments/suggestions for how to improve the simulation.

Data analysis

Quantitative data from the survey was downloaded from Qualtrics survey software and analyzed using SPSS, version 26.0. The data were cleaned to ensure there were no out of range or implausible data included in the analysis. Respondents who did not answer beyond the first question of the survey were excluded from analysis. Descriptive statistics were calculated for the post-simulation survey. Qualitative data obtained from the debrief and the open-ended question on the survey were analyzed using congruence and memoing. In addition, the facilitators' notes from the debrief were also used. *A priori* themes were identified through the development of the debriefing questions. Additional subthemes were established as part of the analysis.

Results

Demographics

In total, 60 students responded to the online survey. Of these, 14 were excluded due to not completing beyond the first question of the survey, and two were excluded for not participating in the health equity simulation, leaving a final sample of 44 respondents. Twenty-five respondents answered the open-ended survey question. The majority of respondents were between 20 and 24 years of age ($n=21$, 48%) and identified as female ($n=39$, 89%). The remainder identified as male ($n=4$, 9%) or preferred not to answer ($n=1$, 2%). When asked to self-report their race and ethnicity, the majority of participants responded White or Caucasian ($n=27$, 61%), five responded African American or Black (11%), five responded Hispanic or Latino (11%), four Asian or Pacific Islander (9%), and two responded other (5%).

Post-simulation survey

Overall, students rated the health equity simulation as a worthwhile, eye-opening experience that should be repeated. Regarding measures of attitudes about working with population that have been marginalized, 88% ($n=39$) students reported believing that there is a role for the nursing profession in creating the environment to support health equity. Students also reported an increased knowledge of several different aspects of health equity, including 75% ($n=33$) of respondents strongly agreed/agreed that the health equity simulation

enhanced their awareness of the SDoH. When asked if they would recommend use of the health equity simulation in the future, the majority of students strongly agreed/agreed (n=32, 72%).

Post-simulation debrief and open-ended survey question

Three major themes emerged from the debrief and open-ended survey questions related to the primary aim: (a) understanding SDoH and health equity; (b) attitude/perspective change; and (c) managing conflict. During the debrief, one student shared, *“Eye-opening how one disadvantage can impact our entire life. I was in jail [tells story of character from the simulation]. Doesn’t take a lot to ruin everything. Everything spiraled out of control just from failing to stop at a stoplight.”* Another student stated, *“I was a homeless person with an engineering degree. You don’t typically think of homeless people as having a college degree. Changes your perspective on how do I approach homeless or uninsured, what am I doing that’s treating them as lesser.”*

One comment on the open-ended survey question revealed, *“My peers have had a perspective change on a nurse’s role in public health and providing resources to populations experiencing disadvantage. They feel as though they shouldn’t do anything because it isn’t their place to get into anyone’s business or interrupt anyone’s life or lifestyle.”* A second comment recommended, *“Maybe have a trigger warning beforehand and explain the need for students to be respectful of the fact that although the “family” they have may not be relatable to them, their peer may not think the same way. To converse about these differences in an open environment instead of angrily outside of class may relieve some unintentional stress.”* Another student stated, *“Simulation was a good reminder of all the other factors that affects someone’s health. And to be frank, whether my peers loved or hated it, we won’t be forgetting any time soon the experience of putting ourselves in the shoes of someone who is vulnerable.”*

Four themes emerged related to the secondary aim: (a) format change; (b) time; (c) value; and, (d) organization.

Format change: This theme was verbalized by all respondents. Overall, suggestions included wanting smaller class size, being given fake money with which to complete the scenarios, increasing the challenge of the simulation to better mimic reality, and having a longer pre-brief in order to explain the simulation experience better. For instance, one respondent stated that the simulation was *“... too easy. As a homeless man, it was too easy to get from one place to the next,”* while another *“thought we would get paper money and have to ration.”* Another example of this response type included: *“I think that it would be better to have the volunteers actually talk to the families and maybe treat them differently depending on their family situation. I think it would be more realistic if they were like denied or treated poorly compared to someone who has money or is a different race.”*

Time: Eleven respondents brought up the issue of time, with the overwhelming majority suggesting that more time was needed for the simulation. Several respondents suggested more time specifically for the debrief portion of the simulation. An example of a response relating to time included: *“For a topic that is at the core of the practice of nursing, the time allocated for the simulation was not enough to fully experience, understand and appreciate the big picture when it comes to social determinants of health and its impact.”*

Value: Four respondents addressed the value of the simulation, with mixed opinions. Half of the respondents discussed the simulation as valuable, with statements such as *“I think the idea of the health equity simulation was very good. I think it is extremely important that we understand how factors affect health.”* The other half expressed that the simulation could be made more valuable with some changes such as using population health clinical or real clients to highlight real-life health inequity would be more impactful on student learning. An example of this response type included: *“A panel or something similar of real-life patients who have dealt with health inequity would have been a really profound way to bring these simulations to a level that would help us see how these inequities can play our [sic] and have played out for patients.”*

Organization: Four respondents mentioned issues regarding the organization of the simulation. Students followed the script in the scenario to receive services at several service stations staffed by volunteers, who were trained, but very briefly before the simulation. Some students reported missing papers and missing information at the service stations of the simulation. Another student reported difficulty in completing the tasks in a

confined space as there were no classrooms big enough to allow for over 90 students to move around at the same time during the simulation.

Discussion

A primary intended outcome of the health equity simulation was to educate nursing students to the role of the nursing profession in assisting health equity. Overall, students reported that the simulation increased awareness and understanding of SDoH and health equity. They expressed perceived change in attitude/perspective, both positive and negative, about working with populations that have been marginalized. In addition, some students experienced conflict in relating to their peers and relating to the family profiles used in the simulation.

The data collected through the debrief sessions and open-ended survey question recommended three changes to the simulation. These recommendations included allotting more time for the simulation during the course; providing more detailed instructions before the start of the simulation; and, enacting a more structured debrief session at the completion of the simulation. Although there were mixed reviews on the value of the simulation, a fourth recommendation was to use the simulation, with some changes, for future nursing students. Ultimately, the health equity simulation was identified as a beneficial addition to the population health curriculum and recognized as a potential valuable component of increasing students' understanding of the SDoH and health equity.

To address these recommendations outcomes, several strategies should be considered for the future. First, to ensure that health equity and SDoH concepts are woven into the pre-licensure nursing curriculum in a formal and purposeful fashion. Second, the use of a health equity simulation should be considered for other nursing education activities, beyond only population health courses. The content of the health equity simulation lends itself well for courses such as ambulatory care, service learning, or synthesis courses. Faculty teaching various courses to the same cohort of students could create a synergy on health equity and SDoH content by coordinating and sharing simulation time to achieve each course's objectives. Third, in order to help students explore the role the nurses play in addressing health equity from an interprofessional perspective, schools of nursing could collaborate with other health professional schools such as physical therapy, clinical psychology, social worker, theology, pharmacy, and medicine. Finally, several students shared with faculty members after the simulation that they had personally experienced similar challenges faced by individuals in the scenarios. While they highly valued the simulation, they recommended that use of a pre-briefing session to acknowledge that the scenarios may have been experienced by their classmates be conducted in the future. Some of the students who had lived experiences revealed that they would have preferred not to participate in the simulation and to have an alternative option. Future simulation planning should incorporate this into a pre-briefing session.

Limitations

There were several limitations in this pilot project. First, there was no pre-test to measure students' baseline knowledge and attitude regarding health equity and SDoH; therefore, it was not possible to conclude that the students' self-reported changes in health equity and SDoH knowledge and attitude were the result of the simulation. Second, the sample size of respondents was small ($n=44$). Finally, other factors may have influenced the students' responses, including the reluctance to share critical feedback regarding the simulation with debriefers, since these individuals were also course faculty.

Conclusion

Based on the findings of this project, actionable recommendations have been identified to help improve the health equity simulation experiences for nursing education. Across measures of attitude and knowledge about working with populations experiencing disadvantage, 88% (n=39) of students strongly agreed or agreed in the belief that nurses have a role to play in creating health equity; and, 75% of respondents (n=33) strongly agreed or agreed that the health equity simulation enhanced their awareness of the SDoH. Further, the simulation was recognized by the respondents to be a potentially useful experience in helping nursing students understand health equity.

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