Enhancing Nursing Student Perception of Rural Healthcare Through Innovative Simulation Education

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Abstract

Purpose: Rural populations face healthcare access challenges, including rural care provider shortages and rural hospital closures. Simulation-based education could help prepare prelicensure nursing students to address healthcare access challenges for rural populations in their nursing practice through an empathetic approach, however, there is minimal evidence comparing the effectiveness of simulation and to non-simulation education methods on this topic. The purpose of this study was to compare the effectiveness of a simulation and non-simulation online nursing education intervention on nursing student empathy, confidence, knowledge, and advocacy to care for rural populations.

Sample: Prelicensure nursing students (n=25) enrolled in their final semester of nursing school completed this study.

Method: This study used a two-group pre-post-test design. The authors designed and created simulation-based and non-simulation-based interventions about rural population health piloted in a population and community health nursing course. Pre- post-survey data were collected about participant self-assessment of their empathy, confidence, knowledge, and advocacy.

Findings: Confidence and knowledge mean scores increased for both the simulation and non-simulation groups. The mean empathy score did not change for the simulation group from baseline, and a one point mean score increase in empathy was observed for the non-simulation group. The mean score for advocacy did not change for either simulation group. Using a mixed model to estimate effects of interventions, time, and age on confidence, there was a significant effect between time 1 and time 2 for confidence ($F=9.02$, $p=0.01$), but not a significant effect observed between the different simulation types, the interaction between time and the intervention type, or age.

Conclusions: Both the simulation and non-simulation online interventions created for this study provide an effective approach to instilling knowledge and confidence in prelicensure nursing students toward the rural population's healthcare needs by introducing potential solutions to address the challenges of caring for rural populations.

Keywords: Rural nursing education, Simulation, Student Perspectives

Enhancing Nursing Student Perception of Rural Healthcare Through Innovative Simulation Education

For decades, rural healthcare access and quality has remained a longstanding public health concern for rural Americans (Callaghan et al., 2023). Compared to urban populations, rural

populations face unique challenges in accessing healthcare related to chronic healthcare provider shortages, hospital closures, and geographic isolation from major medical centers (Iglehart, 2018). Rural residents must often travel long distances to access highly specialized healthcare (Douthit et al., 2015). Evidence from prior research suggested that nursing resources, such as the proportion of BSN prepared nurses working in hospitals, decreased the more rural an area becomes (Smith et al., 2019). Rural healthcare resource scarcity could be associated with poorer outcomes for rural as compared to urban patients (Douthit et al., 2015).

Even though technological innovations such as telehealth may be able to help rural residents overcome healthcare access challenges, bedside nurses unfamiliar with the realities of rural living (i.e., unreliable Internet access) may not be prepared to help rural patients navigate and overcome barriers to obtaining healthcare. It is, therefore, important for prelicensure nursing programs to introduce nursing students to rural population health challenges as a means for them to develop an empathetic perspective regarding rural patients' experiences in accessing healthcare. Empathy is defined as the ability to "sense the client's private world as if it were your own, but without ever losing the 'as if' quality" (Rogers, 1957/1992, p. 829). Being able to see through the lens of the rural patient is important because, for rural residents, healthcare is considered 'high quality' if a person-centered approach is used (Baernholdt et al., 2010). Rural residents are accustomed to living in communities featuring a smaller population and often have a reliance on close personal ties to achieve goals in their local community (people 'wear multiple hats', etc.; Stellflug & Mock, 2022). Part of fostering rural person-centered care between nurses and rural patients is incorporating an empathetic approach to nursing care that acknowledges rural residents as people facing specific rural-related challenges in managing their health, such as being geographically isolated from healthcare specialties.

To further enhance rural population care, it is important for nurses to cultivate a deeper understanding of the rural residents' top healthcare needs. This could help build nurses' confidence in being able to provide effective care for rural populations. There are four modes to enhance confidence according to Bandura's (1977) theory of self-efficacy (i.e., "the conviction that one can successfully execute [a] behavior required to produce [an] outcome", p. 193), including performance accomplishments, vicarious experiences, verbal persuasion, and emotional arousal. Creating learning opportunities for prelicensure nursing students to see through the lens of rural patients provides a vicarious experience for them to increase their confidence to care for rural populations facing a plethora of healthcare access challenges.

Classroom and simulation education could help prelicensure nursing students build their own personal understanding of fostering rural healthcare incorporating their existing life experiences. The National Council of State Boards of Nursing (NCSBN) defines simulation as, "activities that mimic the reality of a clinical environment and are designed to demonstrate procedures, decision-making and critical thinking through techniques such as role-playing and the use of devices such as interactive videos or mannequins" (Chisari et al., 2005, p. 2). Use of simulation-based learning is consistent with a constructivist learning approach, whereby learners create a new understanding of phenomena as a part of the learning process (Aebersold, 2018; Vygotsky, 1978). Simulation-based learning experiences rooted in constructivism hold promise for offering prelicensure nursing students opportunities experience caring for patients from rural areas, especially if learning in a rural setting was not an option during clinical rotations (Mennenga et al., 2016), thereby helping them improve their aptitude to provide rural person-centered care. Minimal evidence, however, exists to understand the differential impact of simulation and non-simulation-based education on

prelicensure nursing students' empathy, knowledge, confidence, and desire to advocate for the improved care of rural populations.

Purpose

The purpose of this study was to test and compare the effectiveness of a simulation-based and a non-simulation-based nursing education intervention to increase prelicensure nursing students' empathy, knowledge, advocacy, and confidence to provide rural population healthcare. Evidence to inform effective methods to provide undergraduate prelicensure nursing student education about rural population healthcare challenges is an important step in ensuring future nurses are equipped to provide culturally respectful and dignified rural population care.

Methods

Definition of Rural

For this study, rural was defined as the self-identification of living in a rural community based on the patient's sociological or cultural lived experiences as a rural resident. In a recent study, self-reported rurality has been used to more effectively reclassify the Rural Urban Commuting Area classifications from a patient-centric perspective (Krutsinger et al., 2023), by asking patients the question, "do you live in a rural area" and the rationale for their response. Since the module placed emphasis on the fact that nurses may encounter patients who identify as living in a rural area in both urban and rural healthcare settings, we relied on a patient-centric self-classification as rural, as it would be the most practical, culturally respectful, and dignified method for a bedside nurse to determine a patient's rural self-identification. Given that this was an educational intervention for prelicensure nursing students about the care of rural populations, this study's design did not require us to measure and differentiate rural from urban geographic areas.

Design

This study used a two-group pretest-posttest design, where key variables were measured before and after groups participated in one of two interventions. The target population was senior undergraduate nursing students at a large Southwestern university enrolled in a population and community health nursing course. G*Power 3.1.9.7 was used to calculate an a priori power analysis for mixed factorial ANOVA. The planned analyses required 98 total participants based on a moderate effect size ($f = 0.25$), 80% power, and alpha of .05. This anticipated moderate effect size was based on an average moderate gain in empathy found across eight 2 group case-control studies and randomized control trials (RCTs), a finding from a systematic review of the effectiveness of empathy education for undergraduate nursing students (Levett-Jones et al., 2019).

Interventions

Simulation intervention

The simulation intervention consisted of modular content, described in the prior section, plus a three-part simulation video vignette about rural population health. We designed and filmed a 3-part video vignette to be accessed asynchronously, which served as the simulation. This 3-part simulation video vignette was designed to help nursing students take the perspective of a rural resident navigating the complexities of seeking cancer care outside of their rural community in an urban setting. Part 1 illustrated a scenario of a nurse discharging a patient from the hospital to home and providing the education needed for a patient who lives farther from healthcare resources needed for cancer treatment. Part 2 illustrated a healthcare provider engaging a patient for their initial telehealth visit and helping the patient navigate challenges in their treatment. Part 3 illustrated the follow-up telehealth visit, with a continuation of the healthcare provider following up on the patient's complications post chemotherapy while living in an under resourced rural area. Reflection questions were included with each part of simulation.

Non-simulation intervention

The non-simulation intervention included modular content that addressed rural population health disparities (i.e., greater prevalence of chronic illness and more limited access to healthcare; Bolin et al., 2015; Council on Graduate Medical Education, 2022), community health nursing and rural population case management (including the importance of approaching rural populations with empathy; Bas-Sarmiento et al., 2019; Chua et al., 2021), inter-professional collaboration to improve rural population health, and communication strategies to care for rural populations, such as telehealth (Rutledge et al., 2014).

Measurement Tools

Empathy

Kiersma-Chen Empathy Scale (KCES) items were used to measure empathy (Kiersma et al., 2013). The KCES has a documented Cronbach's alpha greater than .80. Upon initial analysis of the scale's reliability, we found a Cronbach's alpha of .73 for the pre-survey sample, but a lower than anticipated Cronbach's alpha for the post-survey sample of .47. This prompted us to investigate the literature further for additional psychometric evaluations of the KCES. In a later publication including 1,793 participants, several revisions of the KCES enhanced its validity and reliability, resulting in the Kiersma-Chen Empathy Scale-Revised (KCES-R). The KCES-R omits the 4 reverse-scored items, as those items were deemed confusing (Aronson et al., 2022).

For this study, therefore, we computed an 11-item empathy scale omitting four reverse coded items (Aronson et al., 2022; Blakely et al., 2021). Items were answered using an agreement scale from 1-7, where 1 = *strongly disagree* and 7 = *strongly agree*. The range for this modified 11-item empathy scale is 11-77, where 11 is the lowest score, and 77 is the highest score. This modified

11-item version yielded a Cronbach's alpha of .76 for the pre-survey sample (n = 48) and .58 for the post-survey sample (n = 25).

Confidence

The Confidence in Managing Challenging Situations Scale (Confidence Scale; Walsh et al., 2021), a valid and reliable 21-item tool, was used to measure pre- and post-intervention confidence of nursing students to care for rural populations given their unique needs. Permission was received from the corresponding author of Walsh et al. (2021), to add mention of caring for rural population in the item stems and instructions (N. Mustafa, personal communication, August 15, 2022). Confidence to problem-solve about the unique needs of rural patients in a simulation is important for assuring that nurses are prepared to strive for the best possible patient outcomes for rural residents. Items of the Confidence Scale were answered using a 5-point Likert scale from 0-4, where 0 = *no confidence* and 4 = *high confidence* (Walsh et al., 2021). Part one is 9 items, and part two was 12 items. Total scores from 0-29 equate to low confidence, 29 - 60 is considered confident, and 61 - 84 represents high confidence (Walsh et al., 2021). Walsh et al. (2021) found that the Confidence Scale had a Cronbach's alpha of .86. For the pre-intervention group (n = 48), the Cronbach's alpha was .91. For the post-intervention group (n = 25), the Cronbach's alpha was .93.

Knowledge

Knowledge of rural population needs was measured pre- and post-intervention using a four-point agreement scale using the following stem: "I understand the unique healthcare needs of rural populations" (1 = *strongly disagree*; 4 = *strongly agree*).

Advocacy

Desire to advocate for rural populations' healthcare needs was measured pre- and post-intervention using a four-point scale using the following stem: "It is important to advocate for rural populations' healthcare needs" (1 = *strongly disagree*; 4 = *strongly agree*).

Demographics

Sample demographic items included participants' age, gender, ethnicity and race, and marital status.

Data Collection

Ethical approval was received from our institution's Institutional Review Board to conduct this minimal risk study. Interventions were piloted in the college's population and community health nursing course. Students were able to learn from the course content created for these interventions regardless of their decision to participate in this IRB-approved study. The two groups of students who participated were recruited from two cohorts taking the same course for the same degree; however, one cohort was completing a traditional BSN program, and the other an accelerated online BSN program. Thus, the sample frame included 477 senior undergraduate nursing students (245 traditional and 232 accelerated online) taking a population and community health nursing course in their final semester of nursing school in Spring 2023. The traditional group received the simulation intervention, and the accelerated online group received the non-simulation intervention.

Pre-survey

The initial recruitment email and link to participate in the pre-survey was sent before the Spring course began on November 16-17, 2022, and four reminders were sent to non-responders 2 weeks apart each on November 30, 2022, December 14, 2022, December 28, 2022, and January 11, 2023. The initial email and reminders included a unique alpha-numerical ID for each

participant to input into their pre- and post-survey. The rationale for using assigned IDs was to maintain participant confidentiality while also enabling us to link responses for paired analyses. The recruitment email also included information about the opportunity to randomly win one of two $50.00 Amazon.com electronic gift cards as a token of appreciation for full participation, which entailed completing both the pre- and post-survey. From this initial recruitment effort, 19 of 245 traditional (8%) and 29 of 232 accelerated online (13%) responded. For the traditional and accelerated online groups combined, 48 of 477 prelicensure nursing students responded to the pre-survey (10% initial response rate of all students in the sample frame). Refer to Table 1 for pre-survey response rate calculations. The pre-survey was closed before the intervention content was made available for participants.

Intervention

The simulation intervention was embedded in the traditional BSN program population and community health nursing course site, and the non-simulation intervention was embedded in the accelerated online group's site for the same course.

Post Survey

Once both student cohorts completed the simulation and non-simulation interventions, the post-survey was opened. The 48 pre-survey respondents were sent the post survey initial email invitation sent on February 1, 2023, and four reminders to non-responders sent 2 weeks apart each, on February 15, 2023, March 1, 2023, March 15, 2023, and March 29, 2023. From this recruitment effort, 9 of 19 traditional (47%) and 16 of 29 accelerated online (55%) responded. For traditional and accelerated online groups combined, 25 of the 48 responded to the post survey (52% response rate for those who completed the pre-survey; Table 1). The final paired sample included 25

participants who answered the pre- and post-surveys (6 traditional and 19 accelerated online). Response rates for the two groups differed, resulting in unequal samples.

Table 1

Response Rate for Traditional Group and Accelerated Online Groups

	Pre-Survey	Post Survey
Traditional Group (Simulation Intervention)	19/245 = 8%	9/19 = 47%
Accelerated Online Group (Non-Simulation Intervention)	29/232 = 13%	16/29 = 55%
Overall	48/477 = 10%	25/48 = 52%

Note. Response rate was calculated as the number of respondents / total number sampled in each group.

Post Survey Ethical Consideration

Once the post-survey was closed, we posted the 3-part video vignette simulation on the population and community health nursing course site for the students who received the non-simulation intervention for them to receive the same opportunity to enhance their learning about rural population healthcare once the pre- and post-survey data were collected.

Data Management and Analysis

The data management and analysis software was SAS 9.4. There were 25 participants who completed pre-post data for analysis, resulting in 50 observations. Empathy and confidence pre- and post-score distributions were approximately normal, as the Shapiro Wilk statistic (W) was above .80 and not statistically significant ($p > 0.05$) in both groups. Thus, the normality assumption was met to compute linear mixed models.

Demographic statistics were computed to describe the sample, including frequencies and percentages for categorical variables such as age, gender, race, ethnicity, and marital status. For each of the four key variables (empathy, confidence, knowledge, and advocacy), pre- and post-means and standard deviations were computed. Linear mixed models for repeated measures (LMM) to estimate and compare the influence of the 2 interventions on empathy and confidence

at 2 timepoints among the two groups were computed. In these models, we accounted for both groups (simulation and non-simulation), time (time 1 [pre] or time 2 [post]), and the interaction between the groups and time (intervention type*time). Age was included as a covariate for these models as a potential explanatory variable for differences between groups, as the non-simulation group drawn from the accelerated online student cohort was older on average than the simulation group drawn from the traditional campus cohort. To compute these models in SAS, we specified a compound symmetry covariance structure, specified the subject effect to be each participant accounting for their group (simulation or non-simulation). The REML estimation method was specified. There were no missing data to handle, as all 25 participants answered each item in the pre- and post-survey. There were six instances where the post-survey was accessed but not started or completed, thus, these cases had no data to match or include.

Results

Twenty-five participants completed both the pre- and post-surveys. Refer to Table 2 for a detailed description of demographics such as age, gender, race/ethnicity, and marital status.

Table 2

Description of Sample

	Simulation Group *n* = 9	Non-Simulation Group *n* = 16
Age		
18-24	7 (78)	0 (0)
25-34	1 (11)	7 (44)
35-44	1 (11)	6 (38)
45-54	0 (0)	1 (6)
55 or older	0 (0)	2 (13)
Gender		
Male	1 (11)	2 (13)
Female	8 (89)	13 (81)
Gender variant/non-conforming	0 (0)	1 (6)
Race/Ethnicity		
White	1 (11)	10 (63)

	Simulation Group *n* = 9	Non-Simulation Group *n* = 16
Black or African American	2 (22)	3 (19)
American Indian or Alaska Native	0 (0)	0 (0)
Asian	4 (44)	1 (6)
Native Hawaiian or Pacific Islander	0 (0)	0 (0)
Hispanic Biracial	2 (22) 0 (0)	2 (13) 0 (0)
Marital Status		
Married	0 (0)	8 (50)
Divorced	0 (0)	3 (19)
Never Married	9 (100)	5 (31)

There was no change in empathy mean scores for the simulation group from baseline, and a one point mean score increase in empathy for the non-simulation group (Table 3). There was an increase in confidence and knowledge mean scores in both the simulation and non-simulation groups after both interventions (Table 3). There was no change in advocacy mean scores for either group from the pre- or post-survey time periods.

Table 3

Pre-post Scores for Simulation and Non-Simulation Groups: Empathy, Confidence, Knowledge, and Advocacy

	Pre-Survey *M (SD)*	Post-Survey *M (SD)*
Empathy		
Simulation Group (*n* = 9) Non-Simulation Group (*n* = 16)	68.11 (5.23) 68.0 (3.44)	68.0 (2.21) 69.0 (4.38)
Confidence		
Simulation Group (*n* = 9) Non-Simulation Group (*n* = 16)	47 (10) 52 (10)	53 (9) 59 (11)
Knowledge		
Simulation Group (*n* = 9) Non-Simulation Group (*n* = 16)	2.78 (0.67) 2.88 (0.62)	3.22 (0.44) 3.19 (0.54)
Advocacy		
Simulation-Group (*n* = 9)	3.66 (0.50)	3.66 (0.50)
Non-Simulation Group (*n* = 16)	3.75 (0.45)	3.81 (0.40)

Note. Empathy: the mean score theoretical range is from 11 to 77, Confidence: the total mean score theoretical range is from 0 to 84, Knowledge: the mean score theoretical range is from 1 to 4, and Advocacy: the mean score theoretical range is from 1 to 4.

Using an LMM, no significant effects were observed for intervention type (F = 1.80, Numerator DF = 1, Denominator DF = 22, p = .19), time (F = 0.18, Numerator DF = 1, Denominator DF = 23, p = .68), and the interaction between intervention type and time (F = 0.50, Numerator DF = 1, Denominator DF = 23, p = .49). There was a statistically significant effect observed for the effect of age (F = 4.63, Numerator DF = 1, Denominator DF = 22, p = .04) on empathy.

Using a LMM, there was a significant effect of time on confidence (F = 9.02, Numerator DF = 1, Denominator DF = 23, p = .01), but not a significant effect observed for simulation type (F = 0.19, Numerator DF = 1, Denominator DF = 22, p = .67), the interaction between time and intervention type (F = 0.07, Numerator DF = 1, Denominator DF = 23, p = .79), or age (F = 0.95, Numerator DF = 1, Denominator DF = 22, p = .34) on confidence.

Discussion

Our motivation was to test and compare the effectiveness of a simulation and non-simulation intervention on increasing nursing student empathy, confidence, knowledge, and advocacy regarding the care of rural populations. Both interventions increased knowledge and confidence in prelicensure nursing students toward the rural population's healthcare needs and introduced potential solutions to address the challenges of caring for rural populations. Our findings add to other literature noting that simulation activities in nursing education can have a positive impact on nursing students' knowledge acquisition, confidence, and satisfaction in learning (Mulyadi et al., 2021). However, neither intervention resulted in a clinically significant change in empathy, and for both intervention groups, advocacy remained the same.

Empathy regarding rural population healthcare was high for both groups at baseline, a clinically significant finding, as cultural empathy is integral to cultural competence (Everson et al., 2015; Sales et al., 2013) and imperative for safe and effective nursing practice. For both intervention groups, empathy essentially did not change from baseline. In a systematic review of literature published between 2000 and 2018, Levett-Jones et al. (2019) found that nine of 23 studies about empathy among undergraduate prelicensure nursing students demonstrated practical improvements in empathy, and that the most successful studies in improving empathy used an immersive, experiential components and debriefing. That the interventions for this study were in an asynchronous online learning environment may in part explain the lack of change in empathy scores from baseline to post-survey. In addition, another possible explanation for a lack of change in empathy among study participants could be that the sample was comprised of senior prelicensure nursing students in their second semester and as such, have developed more empathy for vulnerable populations, including rural populations. Moreover, the 15-item KCES exhibited low reliability for the sample who completed the post-survey. This prompted us to explore using an 11-item version that omits the four reverse coded items that are noted to be confusing to participants in the literature (Aronson et al., 2022). In future studies, it may be more fruitful to use the adapted KCES-R, as it also includes a global and personal empathy subscale.

In the LMM, there was a statistically significant effect of age on empathy, however, it is not clinically significant. Empathy scores for both the simulation and non-simulation group were similar even though the non-simulation group was, on average, older in age. The non-simulation group was obtained from the accelerated online BSN program that has students who entered with a four-year college degree obtained in another field, thus, these students are on average older than traditional college students starting after graduating high school. In contrast, a study of 700

undergraduate nursing students in Peru, Berduzco-Torres et al. (2021) found that age was among several personal factors influential to the development of empathy in patient care, with a small negative association observed between empathy and age (b = -0.19, p = 0.03) in a multiple regression model including teamwork, loneliness, satisfaction with life, age, sex (women) and nursing school (public). The present study's small sample size may have played a role in the clinically non-significant effect of age on empathy.

Our finding of increased confidence after interventions was consistent with literature about the influence of simulation on improving proficiency and creating confidence in undergraduate prelicensure nursing students caring for rural patients (Rutledge et al., 2014). Although prelicensure nursing students' confidence in managing challenging situations for rural populations remained in the "confident" range (between 29-60) for both groups pre- and post-intervention, there was a measurable increase in confidence for both groups after the intervention. Because the Confidence in Managing Challenging Situations Scale was recently published in 2021, (Walsh et al., 2021), to our knowledge, there is no published evidence describing how our sample's confidence scores to care for specific situations for rural populations compared with other prelicensure nursing students using this same scale.

Understanding the effects of rural healthcare challenges needs to be a part of the undergraduate nursing curriculum, regardless of prelicensure nursing students' future practice setting, to instill knowledge and confidence to care for this population facing broad challenges to healthcare access (Douthit et al., 2015). Our creation of simulation and non-simulation-based nursing education interventions adds to other efforts to educate prelicensure nursing students about the health needs of rural populations and the challenges of providing care in a rural environment are described in the literature, such as the "Simulation Informatics Technology Enhancement"

program in South Dakota (Hendrickx et al., 2014). The simulation created for this study incorporated the use of telehealth for rural populations, which helps to increase access to healthcare for rural populations. Our inclusion of content about using telehealth to provide rural patient care exposes students to a potential solution to addressing rural healthcare access challenges. Telehealth allows patients to see specialty providers in their homes, clinics in their hometowns, or through mobile vans that visit their area (Rutledge et al., 2014). Moreover, telehealth can allow a trusted provider to be with the patient during the visit. Timely follow-up visits with specialty providers can identify complications earlier, affording them the ability to provide interventions in a timelier way that improves patient outcomes (Rutledge et al., 2014).

Our results support the use of simulation as a method to increase prelicensure nursing students' knowledge and confidence about providing healthcare for rural populations. Simulation activities can be designed to mimic real-life healthcare scenarios (Aebersold, 2018) that students may encounter in rural or underserved areas. Rural simulation activities can expose nursing students to a diverse range of patient populations and healthcare needs that may differ from those in urban settings. Exposure to clinical scenarios including rural concepts helps students develop a broader understanding of rural healthcare disparities and cultural competence. Integrating rural simulation into nursing education can boost students' confidence in their clinical abilities, making them better prepared for real-world practice to care for rural populations.

Our findings have implications for future research. The timing of measuring nursing student empathy should be considered carefully for future studies. Researchers should consider exploring nursing student empathy towards rural populations earlier in their nursing program, perhaps exposing them to content about caring for rural populations each semester and measuring their

attitudes over time to determine if a longitudinal intervention with multiple exposures had an impact.

Limitations

There were limitations in the design, and therefore causal inference. The assignment of the intervention depended on the student's cohort; thus, participants were not randomized to the interventions based on the pragmatic concern to not disrupt the instructor's course procedures and student learning. However, the student cohorts had inherent differences that could have influenced outcomes. Participants in the non-simulation group were accelerated online students who were older on average compared to the simulation group comprised of traditional prelicensure nursing students. Increased age and life experience could be a factor in influencing empathy for rural populations. In nursing, there is an ethical imperative to being empathetic and being an advocate, which could result in obtaining a biased sample consisting of those who have high empathy and advocacy intentions. Social desirability bias may also have posed a risk to sample bias. Both groups received some kind of intervention to help enhance their empathy, regardless of whether it was a simulation intervention or not, which could explain not observing differences in empathy across the two groups.

The intervention had limitations. Prelicensure nursing students experienced one exposure to the intervention through a fast-paced course module, therefore, students may not have had enough interaction with the material for it to register a change in empathetic cognition. The sample size of 25 for both groups combined was small. Despite multiple reminders, a minimum of 98 participants were not recruited, and we were not adequately powered to have an 80% chance of detecting a true effect. The low survey response rate may have been attributed to the fact that senior prelicensure nursing students in their final semester of coursework are engaged in many other responsibilities

in addition to completing coursework, such as securing recommendation letters for job applications, completing and submitting job applications, participating in job interviews, and preparing to take the NCLEX-RN. Subgroup sample sizes were unequal, with the non-simulation group composed of accelerated online students having a higher response rate. Accelerated online students are encouraged throughout their program to check their email often due to the nature of being online, thus, their attention to email reminders to participate in this study may have been increased compared to the traditional student group.

There were measurement limitations. Our measurement of empathy was limited to using the original KCES items and scale rather than the updated Kiersma-Chen Empathy Scale-Revised (KCES-R). The KCES-R, a valid and reliable 11-item measurement tool, could be used in future studies to measure pre- and post-intervention empathy before and after interventions. Using the KCES-R, scores can be computed using two sub-scales: global views on empathy in healthcare (7 items) and appraisal of personal empathy ability (4 items; Aronson et al., 2022). Because we used the original KCES scaling, the agreement scale language was used rather than options such as "unnecessary to extremely necessary" and "does not describe me to describes me extremely well," which was a limitation we could not address during data analysis. Further, since the participants were not given explicit instructions to answer items about general healthcare behavior and personal behavior as in the KCES-R, we did not separate these into two subscales for our measurement, which was another limitation. Moreover, we did not measure if participants lived in a rural setting at the time of this study or in the past; this could be an unobserved factor to explain high baseline empathy for this sample and could be an indicator of self-selection bias.

Conclusion

Regardless of the location nurses choose to practice, nurses should understand the challenges rural populations face in obtaining and maintaining healthcare. Strengthening prelicensure nursing students' knowledge, confidence, and empathy to care for rural populations is a step toward better preparing nurses to deliver rural patient-centered care. It is essential for nurses to understand rural patient needs with diverse and sometimes complicated conditions related to the lack of accessible healthcare. Nurses have potential to provide the most empathetic and effective care for rural populations by acknowledging their beliefs and background. Both simulation and non-simulation-based nursing education is beneficial to increase the confidence and knowledge of prelicensure nursing students to care for rural populations, which is essential for delivering rural patient centered care that is meaningful, respectful, and safe.

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Conflicts of Interest

The authors declare no conflicts of interest

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