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Simulation-based education in nursing: Experiences of nursing students in a resource-limited setting

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Background. Simulation-based education (SBE) is increasingly recognised as a transformative strategy in nursing education, offering a safe, structured approach to bridge the gap between classroom learning and clinical practice. In resource-limited settings, where clinical placements are often restricted, SBE provides critical opportunities for skills development and experiential learning.
Objectives. To examine nursing students' experiences of SBE and its perceived role in enhancing clinical competence, confidence, and collaborative skills within a resource-constrained context.
Methods. A qualitative descriptive design was adopted. Purposive sampling recruited nursing students who had participated in SBE sessions. Data were collected through focus group discussions and analysed thematically to identify recurring patterns and themes in students' perceptions and experiences.
Results. Four themes were identified: the preparatory value of SBE, collaboration and instructor support, resource and infrastructure challenges, and limitations of realism. Students reported that SBE enhanced their confidence and supported integration of theory to practice, although concerns were raised regarding outdated equipment and insufficient realism.
Conclusion. SBE offers a powerful solution for addressing clinical training gaps in resource-limited settings. Enhancing competence, confidence and collaborative practice, it equips nursing students for real-world challenges. Sustainable integration into curricula in these settings requires careful policy development and implementation, supported by faculty development and mentorship programmes to optimise its impact.

Keywords: simulation-based education, nursing students, resource-limited settings

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Simulation-based education (SBE) has emerged as a transformative approach in nursing education, bridging the persistent gap between theoretical knowledge and practical clinical application.[1] By providing students with immersive, safe and controlled learning environments, SBE allows repeated practice of clinical skills without risk to patients. Globally, research has demonstrated that SBE enhances critical thinking, decision-making and professional confidence among nursing students, making it an essential pedagogical strategy in modern healthcare education.[1] SBE is underpinned by experiential learning theory and constructivist principles, which emphasise active engagement, reflection and the integration of theoretical knowledge with real-world application.[2] These theoretical underpinnings make SBE particularly useful for preparing students for complex, unpredictable clinical environments,[3] particularly in resource-limited contexts, where access to diverse clinical placements is often constrained.[4,5] Therefore, SBE provides an alternative platform to develop essential competencies safely and effectively.[5]

The adoption of SBE in undergraduate nursing programmes addresses challenges that are particularly pronounced in low-resource settings, such as overcrowded hospitals, insufficient preceptors and limited clinical exposure. These constraints frequently restrict students' opportunities to practice procedures, engage with patients and integrate theoretical concepts with real-world experiences.[5] SBE offers structured scenarios including high-fidelity mannequins, standardised patient interactions and scenario-based simulations that facilitate learning across cognitive, psychomotor and affective domains.[6] By simulating realistic clinical situations, students can gain hands-on experience, subsequently strengthening clinical reasoning and building confidence, which collectively improve readiness for professional practice.[5]

Although SBE is increasingly integrated into nursing curricula globally, its effectiveness within resource-constrained contexts remains insufficiently examined. In particular, the experiences of students who engage with this learning approach have not been explored. Understanding nursing students' experiences is critical to optimising SBE implementation, identifying contextual barriers and facilitators and ensuring that simulation-based learning effectively enhances clinical competence, confidence and teamwork. Existing research, such as the 2022 study by Moabi and Mtshali,[4] has primarily focused on a competency-based diploma programme in nursing offered by private colleges in Lesotho, thereby excluding the public institutions in the country. The demands, infrastructure, human resources and student enrolment of these settings differ significantly from those of private colleges, suggesting that findings from the college context may not be generalisable. This gap underscores the need to explore the lived experiences of undergraduate nursing students with SBE in a low-income public setting, with a focus on the influence of SBE on preparedness, collaborative practice and the challenges encountered during implementation. Insights generated from this study may inform evidence-based educational strategies, faculty development and resource allocation to strengthen SBE in similar low-resource environments. Against this backdrop, the study aimed to explore the experiences of nursing students of SBE in a resource-constrained setting.

Methods

Study design

In this study, a qualitative research design was employed to explore the perceptions and experiences of nursing students of SBE. Qualitative design is particularly appropriate for seeking descriptions of participants' experiences.[7] The research methods were carefully designed to capture rich, in-depth insights from participants and to ensure that the data collected aligned with the study's objectives.

Population and sampling

The participants in this study were drawn from third-, fourth- and fifth-year nursing students enrolled in an undergraduate programme at a resource-limited university. These students were aged between 20 and 23 years, and were selected voluntarily based on their advanced level of training which provided them with extensive exposure to both theoretical and practical aspects of nursing education, including simulation-based learning. A purposive sampling technique was used to recruit a total of 27 participants, ensuring that those with relevant knowledge and experience in SBE were included in the study. A total of three focus group discussions (FGDs) were conducted, with this number of groups determined by data saturation, when no new themes could be identified. The FGDs comprised at least eight participants from a homogenous group. This approach facilitated comfort and open dialogue while collecting diverse yet focused perspectives on the role of simulation in their education.

Data collection

Data were collected through in-person FGDs, conducted in a quiet seminar room to ensure privacy and minimise distractions. The choice of FGDs was based on their advantage in stimulating interaction, allowing participants to reflect collectively on shared experiences. A semistructured interview guide was used (Appendix 1), consisting of broad prompts that explored students' perceptions of SBE, its benefits, its challenges and the areas requiring improvement.

Each FGD lasted between 45 and 60 minutes and was facilitated by a lecturer not involved in SBE, to reduce power dynamics. Field notes were used to document non-verbal cues and contextual observations. Discussions were audio-recorded with consent, transcribed verbatim and verified for accuracy through repeated listening. Member checking occurred during and immediately after discussions, enabling participants to confirm the accuracy of preliminary interpretations.

Data analysis

Thematic analysis followed Braun and Clarke's[8] six-step framework. Familiarisation with data began with repeated reading of transcripts, followed by inductive coding where initial labels were assigned to meaningful units of text. Codes were compared and refined, and related codes were grouped into potential themes. Themes were further reviewed to ensure they accurately reflected the data set, then defined and named. Coding was conducted primarily by the first author, with a code–recode strategy used 2 weeks apart to enhance consistency. A second researcher reviewed a subset of transcripts to support trustworthiness. ATLAS.ti software was used to facilitate the organisation and retrieval of coded data.

Rigour of the study

To ensure the credibility and trustworthiness of this study, member checking was employed, presenting preliminary findings and interpretations to the participants for validation and feedback. After the FGDs were transcribed and thematically analysed, a summary of the identified themes and key findings was shared with a subset of participants. This allowed them to review the interpretations and confirm whether they accurately reflected their experiences and perspectives.

Through this process, participants provided feedback on the themes, clarified any misinterpretations and offered additional insights where necessary. This iterative validation process not only strengthened the credibility of the findings but also enhanced the study's rigour by ensuring that the results were grounded in the participants' authentic voices. Member checking further demonstrated the researchers' commitment to co-constructing knowledge with the participants, reinforcing the reliability of the study's conclusions.

Ethical consideration

Ethical approval for the study was obtained from the relevant institutional review board (ref. no. NU UST A/2024/05) of the university and the national review board. Informed consent was obtained from all participants before their involvement in the study, and measures were taken to ensure confidentiality and anonymity. Participants were anonymised, and pseudonyms were assigned to each during the discussions. Additionally, the data were encrypted with a password and accessed only by the researchers. Participation in the study was voluntary, and participants were informed of their right to withdraw at any time without consequence, although none chose to do so.

Results

The FGDs provided rich insights into the experiences of nursing students with SBE in a resource-limited setting. The analysis identified four major themes: the role of simulation as a preparatory tool, collaboration and instructor support, resource and infrastructure challenges, and limitations of realism in simulations. These themes collectively highlight the strengths and weaknesses of SBE and its impact on nursing education.

Simulation as a preparatory tool

Participants widely acknowledged the value of SBE in preparing them for clinical practice. Students emphasised that the simulation experience provided a safe environment in which to practice and make mistakes without fear of harming real patients. As participants reflected:

> 'Simulation provided a safe environment for me to learn, make mistakes without harming anyone and rectify them. It prepared me for future or real-life experiences.' (FGD1P1)
>
> 'Simulation scenarios afford us a platform to prepare for the reality of the types of patients in hospital settings.' (FGD3P1)

Another participant reported that SBE has proven to bridge the gap between theoretical knowledge and clinical application, while enhancing critical thinking, clinical reasoning and clinical judgement. A fourth-year participant stated,

'The integration of theory and practice helps us understand why things are done in a certain way and the consequences of our mistakes.' (FGD3P2)

Participants expressed the significance of simulation-based experience in smooth transitioning from a classroom context to a clinical context where teaching moments may not be possible. A fourth-year student reflected:

'I would say it really helps us using the simulation laboratories for learning because we get to practice what has to be done in the clinical areas. Because we may find that there are so many patients and we are told that there is no time to teach us in hospitals.' (FGD4P3)

Students also appreciated the confidence-building aspect of SBE. As one third-year student noted:

'Anything you've performed yourself is very hard to get wrong later, even in real life.' (FGD2P1)

However, students identified limitations in the preparatory role of SBE. One participant remarked:

'There's a lot that I should have known by the time I got to the hospital, but I didn't, because we were limited to mannequins.' (FGD2P2)

The nursing students appreciated SBE for enhancing a smooth transition from the classroom context to clinical practice, bridging the theory-practice gap, and thus preparing the nursing students for clinical reality. However, they acknowledged the contextual resource limitations in SBE.

Collaboration and instructor support

Participants reported that SBE helps to create a structured and supportive learning environment. Students appreciated the dedication and availability of clinical instructors during the simulation experience sessions. A fifth-year student noted:

'Our instructors are available to guide us and ensure we practice properly.' (FGD1P7)

On the contrary, other participants added that the facilitators were insufficient in numbers:

'The facilitators are not enough for the guidance of all learners; sometimes we are left with only one facilitator.' (FGD3P2)

Additionally, a third-year participant supported:

'Supervision in simulations giving authentic clinical scenarios improves confidence and competence.' (FGD2P4)

Collaboration among peers and senior student mentors was another strength. As participants highlighted:

'We are given a chance to work together, help each other and collaborate during simulations.' (FGD1P2)

'Learning from our senior nursing students during our mentorship sessions is helpful and enhances confidence and competence in a more relaxed environment.' (FGD2P)

The structured nature of SBE sessions, which combined theoretical and practical elements, was also praised. As one student shared:

'The rationalisations provided during simulations help us understand the broader implications of our actions in different scenarios.' (FGD3P2)

Resource and infrastructure challenges

While students acknowledged the availability of basic equipment in the simulation lab, they emphasised resource constraints. A third-year student explained:

'Imagine if we had enough mannequins; we wouldn't have to wait in groups of 12 or 13, where only one person is participating.' (FGD2P4)

Outdated and inauthentic equipment further limited the effectiveness of simulations. A fifth-year participant shared:

'Some of the equipment is outdated, making it harder to visualise real-world scenarios.' (FGD1P5)

Limitations of realism in simulations

A recurring theme was the lack of authenticity in the simulated scenarios. Students expressed difficulty translating simulation experiences to real-world settings. A third-year participant remarked:

'Mannequins don't react like real patients, so sometimes it feels artificial.' (FGD3P2)

'Because you get to see the patient's reaction and when you do something wrong.' (FGD3P2)

The gap between lab simulations and clinical placements was also evident. One participant noted:

'Sometimes the simulated settings are not the same as the real patient experience, where there is no equipment and insufficient personnel.' (FGD2P6)

Discussion of findings

This study explored the experiences of nursing students in SBE, highlighting its significant role as a preparatory tool in nursing education, especially within the context of limited resources. Nursing students consistently emphasised how SBE supports the practical application of theoretical knowledge acquired during their studies. Through simulation, students can integrate psychomotor skills, theoretical concepts and affective learning domains into cohesive and meaningful practice. This process bridges the long-standing gap between theory and practice in nursing education, a challenge well documented in previous research.[9]

SBE was recognised for providing a safe, structured environment where students could practice repeatedly without the immediate pressures of real-world clinical settings. Previous studies have suggested that SBE creates opportunities for repeated practice, which helps improve knowledge, skills and attitudes in this controlled environment and enhances preparedness for real-world hospital care, building both competence and confidence in nursing students.[10] These findings align with some authors[6,11] who argue that well-planned simulation experiences are essential for achieving expected learning outcomes, including skill development and the integration of knowledge with practice. In addition, global studies across various medical disciplines have demonstrated that simulation improves student readiness while reducing the likelihood of medical errors in clinical settings.[12,13]

The preparatory nature of SBE is particularly important in resource-constrained settings where clinical opportunities are often limited. Students noted that traditional clinical placements do not always provide sufficient patient exposure or time to practice essential competencies.[11] In this context, SBE offers a valuable alternative, supplementing real-world experience with targeted, scenario-based learning that prepares students for the complexities of clinical practice.

Another important finding of this study was the role of SBE in fostering collaboration and teamwork among nursing students. Participants highlighted how simulated learning environments encourage peer interaction, teamwork and mutual support, which are critical for professional growth and clinical success. These findings align with those of other researchers,[14,15] who emphasised the confidence and solidarity built through repeated practice in SBE.

Peer support was particularly valued, with participants noting the benefits of pairing junior students with senior students during simulation activities. This mentorship approach was seen as an effective way to facilitate professional skill acquisition and build a collaborative learning environment.[16] These findings align with research advocating for peer mentorship in clinical learning.[17] However, participants also stressed the need for faculty oversight to monitor and guide these interactions, as both senior and junior students may have gaps in their knowledge. Peer-to-peer feedback during repeated simulations was also valued for its constructive nature, fostering a sense of collaboration and teamwork among students.

The role of faculty support during simulation sessions was consistently emphasised by participants as instrumental in facilitating learning. Skilled facilitators not only guide students through simulation scenarios but also provide critical feedback that aids in knowledge construction, clinical skill development and professional growth.[18] Faculty mentorship plays a key role in bridging the transition from theoretical learning to clinical practice, ensuring that students are adequately prepared for the demands of the healthcare environment.[19]

Despite its many benefits, the implementation of SBE faces significant resource and infrastructure challenges. Participants highlighted the need for more high-fidelity simulation equipment to create realistic and immersive learning environments.[20] Modern equipment, such as advanced mannequins, is critical for enhancing the transferability of skills from simulation to clinical practice.[21] However, resource limitations, including insufficient medical supplies and outdated equipment, were identified as significant barriers to achieving the full potential of SBE.[22]

This finding reflects broader systemic challenges faced by resource-limited settings, where investments in educational infrastructure often lag behind the growing demand for skilled healthcare professionals.[21] Other studies have stressed the need for strategic planning to optimise available resources, including appropriate time allocation, personnel-to-student ratios and careful scheduling of simulation sessions.[11,22] These findings are consistent with best practice guidelines, which emphasise the importance of meticulous planning and resource allocation in achieving desired learning outcomes in SBE.[22]

In addition to resource constraints, participants noted challenges associated with clinical placements. Limited patient flow and overcrowded healthcare facilities often restrict opportunities for students to practise essential competencies.[14] In these cases, simulation serves as an invaluable supplement to traditional clinical experiences, providing students with opportunities to practise and refine their skills in controlled, simulated environments.[23]

While SBE provides numerous benefits, participants also highlighted limitations related to the realism of simulation equipment and scenarios. The artificial nature of some mannequins and simulation tools was seen as a barrier to immersive learning, detracting from the authenticity necessary for developing clinical competence.[9] Participants noted that these limitations hindered the ability to fully replicate the complexity of real-world patient interactions, particularly in the development of affective domain competencies.[24]

These findings align with existing literature, which emphasises the importance of creating authentic and realistic clinical scenarios to enhance the effectiveness of SBE. High-fidelity simulations, which closely mimic real-life clinical settings, are essential for fostering skill transferability and improving clinical outcomes.[20] However, resource limitations often restrict access to such high-fidelity tools, particularly in developing countries like Lesotho.

Additionally, participants reported discrepancies between simulation-based learning and actual clinical practice. These gaps were attributed to resource constraints in clinical placements, where limited equipment and patient diversity often fail to match the scenarios presented during simulations.[21] Addressing these gaps requires investments in both simulation resources and clinical infrastructure, as well as strategic planning to align simulated experiences with real-world clinical practices.[13,21] Thus, institutions can prioritise low-cost, low-fidelity simulation modalities aligned with key learning outcomes and utilise locally available materials. Faculty capacity can be developed through peer mentoring and short, institution-based training workshops. Strategic partnerships with clinical sites and regional institutions may further support resource sharing and sustainability.

In summary, while SBE is a critical tool for bridging the gap between theoretical learning and practical application, its effectiveness in resource-limited settings depends on addressing challenges related to collaboration, faculty support, infrastructure, and the realism of simulation tools. Through strategic planning, resource optimisation, and investments in high-fidelity equipment, SBE can continue to play a transformative role in nursing education, equipping students with the skills and confidence they need to succeed in clinical practice.

Limitations of the study

The findings of the study reflect the experiences of students from a single setting, and therefore may not be generalisable to other settings. In addition, only the student viewpoint was captured; incorporating faculty and clinical preceptor perspectives could provide a more comprehensive understanding of SBE's effect. Future research that compares experiences across institutions and includes multiple stakeholder groups is recommended.

Conclusion

This study highlights the experiences of nursing students with SBE in resource-limited settings, emphasising its strengths and limitations. While SBE has proven to be an essential preparatory tool, addressing its challenges is crucial to optimise its effect on nursing education. Investments in resources, better planning and enhanced student involvement could significantly improve the effectiveness of SBE. Future research should

explore the long-term effect of SBE on clinical performance and patient care outcomes, particularly in resource-limited contexts. By addressing these challenges, SBE can better prepare nursing graduates to meet the demands of modern healthcare.

Data availability statement. Data are available from the corresponding author on reasonable request, subject to ethical and institutional requirements.

Declaration. The authors declare that this manuscript is an original work that has not been published previously and is not currently being considered for publication elsewhere. Both authors have reviewed and approved the final version of the manuscript.

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