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Perceptions of Undergraduate Nursing Students Towards Simulation-Based Learning: A Cross-Sectional Study

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Abstract *— This study aimed to assess the perception levels of undergraduate nursing students toward Simulation-Based Learning in Nursing and to examine the association between perception levels and demographic characteristics. A non-experimental, cross-sectional quantitative design was employed, involving 171 undergraduate nursing students from selected institutions in Vellore and Dharmapuri Districts of Tamil Nadu. Participants were selected using a purposive sampling technique, and data were collected using a structured self-report instrument based on the Simulation Perception Scale. The data analysis included descriptive statistics and chi-square tests for association at a 0.05 significance level. Results indicated that students demonstrated a favourable perception toward SBL, with 75.22% of participants reporting a positive view. The highest mean score was noted in the domain of Use and Effectiveness of Simulation (Mean % = 84.4), followed by Technological Integration (76.2%). Institutional Support scored moderately (68.0%), while Perceived Barriers scored the lowest (48.2%). No statistically significant association was found between perception levels and demographic variables such as age, gender, year of study, or prior exposure to simulation ($p > 0.05$). Overall, students exhibited a generally positive perception towards Simulation-Based Learning in Nursing. The findings emphasize the importance of integrating simulation into nursing education to enhance learning outcomes. Continued efforts are required to address perceived barriers and improve institutional support for effective implementation of simulation-based strategies in nursing education.*

Keywords *— **Simulation-Based Learning, Nursing Education, Student Perception, Technological Integration, Perceived Barriers***

I. BACKGROUND

The increasing complexity of healthcare delivery demands that nursing education equips students with not only theoretical knowledge but also practical skills and clinical judgment applicable to diverse, real-world environments. Simulation-Based Learning (SBL) has become an essential instructional strategy in nursing curricula worldwide, offering experiential learning through realistic scenarios that enhance students' competence, confidence, and critical thinking without risking patient safety [(1)]. Particularly in Nursing, where nurses play vital roles in health promotion, disease prevention, and managing public health challenges, simulation allows

learners to engage with complex situations such as home visits, health screenings, and culturally sensitive care provision.

Recent studies highlight the positive impact of simulation on nursing students' skill development and preparedness for clinical practice in community settings demonstrated improved readiness among nursing students to handle Maternal and neonatal emergencies in primary care through simulation-based training [2]. Similarly, it was found that immersive community health simulations fostered better communication skills and decision-making abilities (3). These findings align with global trends emphasizing simulation as a bridge between classroom learning and practical application, especially where direct community exposure may be limited due to logistical or public health constraints.

Despite its recognized benefits, students' perceptions of SBL vary, influenced by factors such as faculty support, technological access, and anxiety related to performance in simulated environments. Moreover, limited research has specifically addressed undergraduate nursing students' attitudes toward SBL which requires holistic and context-sensitive approaches. [4]

Understanding students' perceptions is critical, as positive attitudes toward simulation correlate with greater engagement, motivation, and improved learning outcomes. Therefore, this study aims to assess the perceptions of undergraduate nursing students regarding Simulation-Based Learning in Nursing, exploring their perceptions including facilitators and barriers, and examining whether their background variables influence these perceptions. The findings are expected to inform curriculum development and optimize simulation strategies for Nursing education. [5]

Simulation-Based Learning (SBL) has emerged as a pivotal pedagogical tool in nursing education, offering safe, controlled, and realistic environments for students to practice clinical skills and decision-making without endangering patients. With the evolving demands of healthcare and the increasing complexity of nursing curriculum scenarios, there is a growing emphasis on preparing nursing students for diverse, population-centered roles beyond hospital settings. SBL is particularly relevant in Nursing, where students must assess, intervene, and educate within dynamic, resource-limited, and culturally varied environments [1].

Recent literature underscores the effectiveness of SBL in improving clinical competence, communication, and critical thinking among nursing students. For instance, reported that simulation enhanced students' readiness to manage maternal and neonatal emergencies within primary care settings, particularly in rural contexts [2]. In South Korea found that community-based simulations strengthened students' confidence in conducting health assessments and providing education in non-hospital environments [3].

Incorporating simulation in nursing curricula also supports students' development of public health competencies, including teamwork, cultural sensitivity, and health promotion strategies. The use of immersive technologies and virtual simulations in community scenarios improved student engagement and adaptability, especially during the COVID-19 pandemic, when clinical placements were restricted [6].

Despite these benefits, perceptions toward SBL can vary based on exposure, institutional support, and technological infrastructure. While many students view simulation positively, others may experience challenges such as technical barriers, anxiety, or inadequate debriefing [4]. Furthermore, limited research has focused specifically on students' perceptions of SBL in the context of Nursing, where patient interactions, health promotion, and systems thinking differ markedly from acute care settings.

Understanding students' perceptions is crucial to refining simulation practices and ensuring their effectiveness. Positive attitudes often correlate with increased engagement and learning outcomes [5]. Hence, this study aimed to explore undergraduate nursing students' perceptions of SBL in Nursing, identify perceived benefits and barriers, and assess the influence of demographic factors on their views.

II. METHODOLOGY

This study adopted a non-experimental, cross-sectional design with a quantitative research approach. The research was conducted in selected nursing colleges located in Vellore and Dharmapuri

District of Tamil Nadu. The target population for this study consisted of undergraduate nursing students enrolled in selected nursing colleges in Vellore and Dharmapuri Districts of Tamil Nadu. These students, from various year of the nursing program, were included to capture diverse perceptions of Simulation-Based Learning (SBL) as a learning tool within their academic curriculum. A purposive sampling technique was used to select students.

The inclusion criteria

- Enrolment in the second, third or fourth year of the B.Sc. Nursing program.
- Willingness to participate and provide informed consent.

This included 58 students from the 2rd year and 57 from 3rd year, 56 students from 4th year B.Sc., Nursing Programme total 171 students participated in the study. This approach facilitated a appropriate representation of perceptions across the different groups while minimizing potential biases.

III. TOOL DEVELOPMENT

The two parts of the tool are:

Tool I: Background data, including: Age, gender, year of study, prior exposure to Simulation-Based Learning (SBL) in Nursing and the type of simulation used.

Tool II: **Simulation Perception Scale for Nursing Students** is a structured, self-report assessment tool designed to evaluate undergraduate nursing students' perceptions regarding the use, effectiveness, barriers, technological integration, and institutional support related to simulation-based learning in Community Health Nursing, which was slightly modified to use in this study. The scale consists of 25 items divided into four key domains: Use and Effectiveness of Simulation (6items), Perceived Barriers (6 items), Technological Integration and Trends (5 items), and Institutional/Pedagogical Support (8 items). Each item is rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with negatively phrased items (Items 7–12) reverse scored to ensure accurate interpretation of attitudes. Obtainable score is 25-125. Reliability of the tool achieved a Cronbach's Alpha of 0.8**,** indicating good internal consistency.

3.1 Subscale Score Ranges:

- Use & Effectiveness (Items 1–6): min 6, max 30
- Perceived Barriers (Items 7–12, reverse-scored): min 6, max 30
- Technology Integration (Items 13–17): min 5, max 25
- Institutional Support (Items 18–25): min 8, max 40

IV. DATA COLLECTION

Data is collected through self-administration method using Google forms through WhatsApp and E mails.

V. ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Institutional Ethics Committee of the lead investigator's college. Written informed consent was secured from all participants, ensuring confidentiality, anonymity, and voluntary participation. Participants were informed that they could withdraw from the study at any time without penalty.

VI. DATA ANALYSIS

Data were entered and analyzed using IBM SPSS version 26.0. Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to summarize responses. Inferential statistics including the Chi-square test was applied to examine associations between demographic variables and students' perceptions of SBL. A significance level of $p < 0.05$ was considered statistically significant.

VII. RESULTS

Background Profile of Participants

Table 1: Frequency and Percentage Distribution of Background Variables of Nursing Students. (N = 171)

Background Variables	Category	Frequency (f)	Percentage (%)
Age (in Years)	20-22	118	69.01
	> 22	53	30.99
Gender	Male	14	8.19
	Female	157	91.81
Year of Study	II year	58	33.92
	III Year	57	33.33
	IV Year	56	32.75
Prior Exposure to Simulation	Yes	122	71.35
	No	49	28.65

Table 1, reveals that the background profile of the 171 nursing students. Results shows that the majority (69.01%) are between 20 and 22 years old, with the remaining 30.99% being older than 22 years. Females overwhelmingly represent the sample, comprising 91.81%, while males account for only 8.19%. The students are fairly evenly distributed across the years of study, with approximately one-third in each of the second (33.92%), third (33.33%), and fourth years (32.75%). Most of the students (71.35%) reported prior exposure to simulation-based learning, indicating its prevalent use in their curriculum.

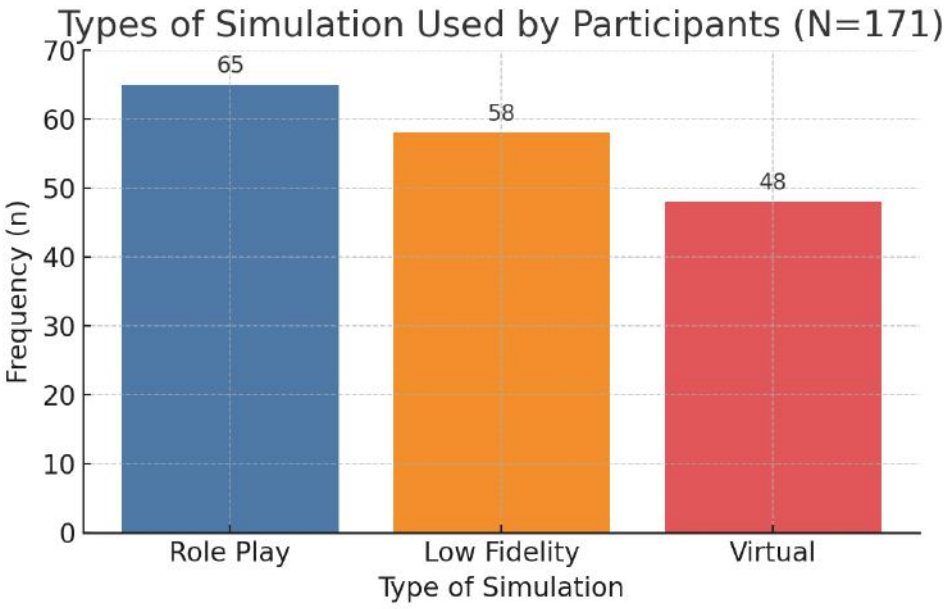

Fig.1.Types of Simulation Used by Participants.

Table 2: The Perception Levels on Simulation-Based Learning in Nursing Among Nursing Students.

(N=171)

Domain	Obtainable score	Min Score	Max score	Mean	Mean %	SD
Use & Effectiveness of Simulation	6-30	16	26	25.32	84.4	0.51
Perceived Barriers	6-30	10	20	14.46	48.2	0.67
Technological Integration	5-25	13	23	19.05	76.2	0.58
Institutional Support	8-40	20	30	27.20	68.0	0.62
Global score	**25-125**	**59**	**99**	**86.03**	**68.8**	**2.21**

The findings presented in Table 2 indicate that undergraduate nursing students hold an overall moderately positive perception towards Simulation-Based Learning (SBL) in Nursing. The highest mean percentage (84.4%) was observed in the domain of *Use and Effectiveness of Simulation*, suggesting that students strongly value the role of simulation in enhancing their understanding and application of community health concepts. The domain of *Technological Integration* also received a favourable response (76.2%), highlighting students' appreciation for the integration of digital tools and platforms in simulation learning. The domain of *Institutional Support* showed a comparatively lower mean percentage (68.0%), indicating a need for improved infrastructural and administrative backing to optimize the simulation experience. The domain of *Perceived Barriers* recorded the lowest mean percentage (48.2%), suggesting that students encounter several challenges, such as limited access to resources, time constraints, or insufficient faculty support, which may hinder the effectiveness of simulation-based learning. The global mean score of 86.03 (68.8%) reflects a generally encouraging perception and underscores the importance of addressing existing barriers and strengthening institutional support to fully realize the benefits of simulation in Nursing education.

Table 3: Frequency and percentage distribution of the perception levels on simulation-based learning in Nursing among nursing students.

(N= 171)

Category	Range	Frequency	Percentage
Unfavourable Perception	1 – 41	0	0
Neutral Perception	42 – 83	43	24.78
Favourable Perception	84 – 125	128	75.22

Table 3 shows the frequency and percentage distribution of overall perception levels towards Simulation-Based Learning (SBL) in Nursing among 171 students. The results indicate that a majority of students (128 out of 171, or 75.22%) demonstrated a favourable perception (scores between 84–125), suggesting that most participants viewed simulation as a beneficial and effective learning method. A smaller proportion of students (43 or 24.78%) had a neutral perception (scores between 42-83), indicating moderate or mixed views about the value or impact of simulation. Importantly, none of the students fell into the unfavourable perception category (scores 1–41), reflecting the absence of strong negative attitudes toward simulation-based learning. Overall, these findings highlight a predominantly positive student response to the integration of simulation in Nursing education.

Table.4. Association Between the Background Variables and the Perception Levels on Simulation-Based Learning Among Nursing Students.

(N=171)

Demographic variables	Category	Favourable perception	Neutral perception	df	Chi-square	P value/ significance
Age (in Years)	20-22	59	59	1	0.32	P >0.05
	>22	24	29			NS
Gender	Female	76	81	1	0.01	P >0.05
	Male	7	7			NS
Year of study	II	29	29	2	0.51	P >0.05
	III	29	28			NS
	IV	25	31			
Previous exposure to simulation	Yes	60	62	1	0.07	P >0.05
	No	23	26			NS

*NS..No significance P<0.05 level

Table. 4 reveals that there was no statistically significant association found between students' levels of perceptions on simulation-based learning in Nursing and their demographic variables, including age, gender, year of study, and previous exposure to simulation ($p > 0.05$ for all comparisons). Students across different age groups (20–22 years and above 22), genders (male and female), academic years (II, III, and IV), and levels of prior simulation experience reported similar levels of favourable or neutral perception. These findings suggest that students' attitudes toward simulation-based learning are generally consistent, regardless of their background characteristics, indicating broad acceptance and perceived value of simulation as a teaching strategy in Nursing education.

VIII. DISCUSSION

The findings of the present study reveals that a significant majority of nursing students (75.22%) exhibited a favourable perception toward Simulation-Based Learning (SBL) in Nursing. This aligns with a growing body of recent evidence supporting simulation as a dynamic, experiential learning method. In particular, the "Use and Effectiveness of Simulation" domain was rated the highest (Mean = 4.22), highlighting the value students place on simulation in enhancing clinical judgment, decision-making, and the application of theoretical knowledge to community health settings. These findings are consistent with those of, who reported that simulation-based training significantly improved students' preparedness and clinical reasoning in public health scenarios among undergraduate nursing students in the Middle East (1). Similarly, a study in Chile confirmed that students perceived simulation as instrumental in boosting competence, especially in managing community and home-based care [7]. High scores in the "Institutional Support" domain (Mean = 4.03) reflect student appreciation for effective debriefing, skilled instructors, and respectful, inclusive simulation environments. This aligns with (3), who found that supportive faculty facilitation and structured debriefing enhanced reflective learning and critical thinking in Korean nursing students engaged in community-based simulations. In a 2024 qualitative study in Tanzania, emphasized the importance of skilled facilitators and safe learning spaces in enabling confidence and practical skill acquisition during neonatal simulation sessions [2].

Interestingly, this study found no statistically significant association between perception levels and

demographic variables such as age, gender, year of study, or prior simulation experience. These findings suggest that the benefits of simulation transcend student background, confirming the universal appeal and applicability of SBL. Similarly, a study reported consistent positive feedback among nursing students across different age groups and academic years during community health simulation programs in Latin America [8]. A study conducted in India also revealed uniform satisfaction across various student demographics, indicating that simulation is broadly accepted as an effective educational tool [5].

The lowest mean score was observed in the "Perceived Barriers" domain (14.46), which, after reverse scoring, indicates that students faced relatively few challenges. This supports the notion that improvements in simulation design have successfully mitigated common issues like performance anxiety, equipment failure, and time constraints. A recent study in Nigeria found a marked reduction in anxiety and discomfort when structured pre-briefing and psychological support were integrated into the simulation process. Additionally, emphasized that student-centered simulation environments significantly reduce emotional barriers and foster psychological safety [9].

Moderate scores in the "Technological Integration" domain (Mean = 19.05) suggest a general acceptance of tools such as virtual simulation, VR, and high-fidelity manikins, although some usability or accessibility issues remain. confirmed that while students appreciated the realism of virtual platforms, barriers such as unfamiliarity with devices or limited access to hardware affected full engagement. More recently, a study emphasized the need for better digital infrastructure and training to maximize the benefits of immersive technologies in Nursing education [6].

Overall, the results affirm the effectiveness of simulation-based learning in fostering essential competencies in Nursing. The consistently favourable perceptions across different student groups highlight simulation's universal value and its potential for broader integration into nursing curricula. Ongoing efforts to refine technological tools and reduce residual barriers will further strengthen the role of SBL as a cornerstone of nursing education.

Previous researches of the Author also has emphasized the importance and demonstrated the effectiveness of SBL[10,11] These findings underscore significant implications for both nursing practice and education. To enhance practice readiness, institutions must strengthen simulation infrastructure by investing in high-fidelity simulators and well-equipped labs that foster realism and preparedness. Faculty competence should be continually developed through training in simulation facilitation and debriefing, while the integration of virtual simulations, especially in resource-limited settings can expand access and engagement. Curricula should be revised to ensure adequate time and focus on simulation in Nursing, fostering essential public health competencies. In nursing education, structured simulation activities can bridge the theory-practice gap, and incorporating both virtual and high-fidelity technologies can offer scalable, realistic learning alternatives where clinical placements are scarce.

In the current era of technological advancement, where patients can access information from multiple sources, there is a growing need for alternative and integrated methods and blended to improve student learning. Consequently, keeping these in mind researchers from the same institution have previously examined a range of teaching-learning strategies (based on the current needs and circumstances), such as OSCE - Objective Structured Clinical Examination [12,13], Problem-Based Learning [14], Virtual Reality training [15], Bibliotherapy [16], and Neuro-Linguistic Programming. [17]

Previous studies also emphasized the importance of building strategies to empower the students that foster Self Esteem, [18] Emotional intelligence, [19] Self Confidence, [20] Creativity, [21] Mindfulness practice [22] and motivation [23] among students to maximize the learning outcome and achieve the goal. SBL when combined with diverse and need based motivational teaching learning strategies can positively influence and facilitate the overall learning outcome.

Therefore, Faculty development and students training on SBL and other innovative approaches remain crucial for effective strategies design and learner engagement, while a student-cantered learning approach promotes critical thinking, communication, and decision-making skills which

are relevant in Nursing. Finally, institutions must prioritize sustained investment in students learning including simulation resources and support systems to ensure the long-term quality and impact of nursing education.

IX. CONCLUSION

In conclusion, simulation-based learning is perceived as a valuable tool for enhancing undergraduate nursing education, particularly in Nursing. While students appreciate the effectiveness of simulations in improving their clinical skills and preparedness for community practice, barriers such as inadequate infrastructure, faculty training, and realism in scenarios must be addressed. This study had few limitations that may affect the interpretation and generalizability of findings. It was limited to selected institutions in two districts, with purposive sampling potentially introducing bias. Investing in simulation resources, faculty development, and virtual simulation technologies will help overcome these barriers and improve the overall quality of nursing education.

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