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Original Research Article

NURSING STUDENTS KNOWLEDGE AND ATTITUDE TOWARDS VITAL SIGN MONITORING DURING CLINICAL PRACTICE

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Abstract: *Vital sign monitoring is a fundamental nursing skill critical for early identification of clinical deterioration and effective patient management. However, gaps in knowledge and inconsistent practices among nursing students can compromise patient safety. This study aimed to assess the knowledge, attitudes, and practices of nursing students regarding vital sign monitoring in a tertiary care hospital in Lahore, Pakistan.* ***Methods:*** *A descriptive cross-sectional study was conducted among 130 nursing students enrolled in Bachelor of Science in Nursing (BSN) and Post Registered Nurse (Post RN) programs. Data were collected using a structured, prevalidated questionnaire covering demographic details, knowledge, and attitudes related to vital sign monitoring. Statistical analysis was performed using SPSS version 26, with descriptive and inferential statistics employed to summarize findings and identify associations.* ***Results:*** *The study revealed moderate knowledge levels among participants, with 58.6% able to relate vital signs to pathophysiology. However, 53.4% reported limited knowledge in interpreting vital sign changes. Attitudes were generally positive, with 45.1% relying on standard respiratory rate ranges when SpO2 levels were normal. Practical gaps were noted, including reliance on technology rather than manual monitoring. Education and experience significantly influenced knowledge and attitudes ($p < 0.05$).* ***Conclusion:*** *While nursing students demonstrated moderate knowledge and positive attitudes, critical gaps in practices and specific knowledge areas were identified. Enhanced training programs, simulation-based learning, and regular competency assessments are essential to improve vital sign monitoring skills among nursing students, ensuring better patient safety outcomes.*

Keywords: Vital Sign Monitoring, Nursing Education, Nursing Students, Patient Safety, Clinical Competencies, Pakistan

Introduction

Vital sign monitoring is a fundamental component of patient care and an essential skill for nursing students to develop during their clinical training. Accurate measurement and interpretation of vital signs, including temperature, pulse, respiratory rate, and blood pressure, play a critical role in identifying clinical deterioration and guiding timely interventions (1,2). Despite its importance, studies worldwide have highlighted gaps in the knowledge and practices of nursing students, raising concerns about patient safety (3).

In Pakistan, where healthcare systems face challenges such as limited resources, high patient-to-nurse ratios, and inconsistent training programs, the importance of proficient vital sign monitoring cannot be overstated (4). Nurses and nursing students are often the first point of contact for patients in clinical settings, making their role pivotal in early detection of complications and implementation of life-saving interventions (5). However, studies conducted in similar low- and middle-income countries suggest that reliance on technology and routine documentation can lead to neglect of manual and accurate vital sign assessments (6). The integration of advanced nursing education programs such as Bachelor of Science in Nursing (BSN) and Post Registered Nurse (Post RN) in Pakistan has aimed to address competency gaps in clinical practice. However, limited research exists on the knowledge and attitudes of nursing students regarding vital sign monitoring in the Pakistani context (7). For instance, Ahmed et al. highlighted that while nursing students in Pakistan are trained in vital sign monitoring, the understanding of its clinical significance and the ability to relate changes to underlying pathophysiology remain inadequate (8).

Globally, evidence suggests that structured education and simulation-based training significantly improve the competency of nursing students in vital sign monitoring (9). For example, Lavelle et al. demonstrated that integrating advanced clinical skills training into nursing curricula enhanced students' confidence and accuracy in monitoring vital signs (10). Such approaches could be adapted to the Pakistani healthcare system to address the observed gaps and ensure better clinical outcomes.

This study aims to evaluate the knowledge and attitudes of nursing students regarding vital sign monitoring in a tertiary care hospital in Pakistan. By identifying the strengths and weaknesses in their understanding and practices, the findings will inform targeted educational interventions and contribute to improving the quality of nursing care in the country.

Methodology

The study utilized a descriptive cross-sectional design to evaluate the knowledge and attitudes of nursing students regarding vital sign monitoring in a tertiary care hospital. This design was chosen to capture a comprehensive snapshot of the current understanding and perceptions among nursing students during their clinical practice.

The target population for this study comprised nursing students enrolled in Bachelor of Science in Nursing (BSN)

programs and Post Registered Nurse (Post RN) programs at the tertiary care hospital. A total of 130 participants were selected through convenience sampling. The inclusion criteria required students to have completed at least one semester of clinical training and to be actively involved in patient care activities. Students who were on leave or declined to participate were excluded from the study. The sample size was determined to ensure adequate representation and statistical reliability.

Data collection was conducted using a prevalidated structured questionnaire designed based on existing literature and expert input. The questionnaire was divided into three sections: demographic information, knowledge regarding vital sign monitoring, and attitudes toward vital sign monitoring. The demographic section gathered data on age, gender, marital status, educational qualifications, professional experience, and current department of clinical practice. The knowledge section assessed participants' understanding of vital signs and their clinical significance, while the attitudes section utilized a Likert scale to evaluate their perceptions and approaches toward vital sign monitoring in practice.

Ethical approval for the study was obtained from the institutional review board of the tertiary care hospital. All participants were informed about the purpose of the study, and written informed consent was obtained prior to data collection. Confidentiality and anonymity were maintained throughout the study, and participation was voluntary.

Data collection was carried out over a period of one month, with questionnaires distributed during clinical shifts to minimize disruptions in patient care. Research assistants were available to clarify any queries and ensure the accuracy and completeness of responses. The collected data were reviewed for completeness and entered into a secured database.

Data analysis was performed using SPSS version 26. Descriptive statistics, including frequencies and percentages, were used to summarize demographic characteristics, knowledge levels, and attitudes. Chi-square tests were applied to identify associations between demographic variables and participants' knowledge and attitudes. Internal consistency of the questionnaire was confirmed using Cronbach's alpha, with a reliability coefficient exceeding 0.8.

Results

This study aimed to assess the knowledge and attitudes of nursing students toward vital sign monitoring during clinical practice. The demographic data showed that the majority of participants were aged 31–35 years (42.1%) and predominantly female (69.9%). A significant proportion of the participants were single (50.4%), had 6–10 years of professional experience (36.1%), and held a BSN (Generic) qualification (35.3%). Most nursing students worked in departments categorized as "Other" (56.4%) rather than medical or surgical wards (Table 1).

The knowledge assessment revealed that most participants demonstrated limited understanding in key areas. For example, 58.6% agreed that they could relate vital sign readings to the physiology and pathophysiology of presenting diseases. However, a substantial proportion (53.4%) acknowledged that their knowledge of interpreting vital signs to identify clinical deterioration was limited. Similarly, 44.4% agreed that changes in vital signs were not interpreted accurately by student nurses (Table 2).

Attitude-related findings showed mixed perspectives among participants. While 42.1% of participants agreed that respiratory rate values are often estimated for stable patients, 45.1% agreed that they recorded respiratory rates as a standard range (12–20 breaths/min) if SpO2 levels were normal. Additionally, 42.1% agreed that the use of pulse oximetry reduced the need to count respiratory rates (Table 3).

The results indicate that participants had moderate knowledge of vital sign monitoring, with notable gaps in understanding the clinical implications of vital sign changes. Attitudes were generally positive but revealed a reliance on standard procedures such as pulse oximetry rather than manual monitoring. These findings emphasize the need for enhanced training and education to improve both knowledge and practices among nursing students.

Table 1: Demographic Characteristics of Participants

Variable	Category	Frequency (%)
Age	21–25 years	13.5
	26–30 years	39.1
	31–35 years	42.1
	36–40 years	5.3
Gender	Male	30.1
	Female	69.9
Marital Status	Single	50.4
	Married	49.6
Experience	1–5 years	33.8
	6–10 years	36.1
	10–15 years	30.1
Qualification	Diploma in Nursing	32.3
	Post RN	32.3
	BSN (Generic)	35.3
Department	Medical wards	18.8
	Surgical wards	24.8
	Other	56.4

Table 2: Knowledge of Vital Sign Monitoring

Questions	Respond	Frequency %
I can relate vital signs readings to physiology and pathophysiology of presenting diseases.	Strongly agree	48 (36.1%)
	Agree	78 (58.6%)
	Neutral	7 (5.3%)
My knowledge in interpreting vital signs to identify clinical deterioration is limited.	Strongly agree	23 (17.3%)
	Agree	71 (53.4%)
	Neutral	36 (27.1%)
	Disagree	3 (2.3%)

Changes in vital signs were not interpreted accurately by student nurses	Strongly agree	26 (19.5%)
	Agree	59 (44.4%)
	Neutral	29 (21.8%)
	Disagree	16 (20.0%)
	Strongly	3 (2.3%)
	Strongly	3 (2.3%)

Table 3: Attitudes toward Vital Sign Monitoring

Questions	Respond	Frequency%
Respiratory rate value is usually estimated for stable patients during routine vital signs monitoring.	Strongly agree	13 (9.8%)
	Agree	56 (42.1%)
	Neutral	32 (24.1%)
	Disagree	25 (18.8%)
	Strongly disagree	7 (5.3%)
The use of pulse oximetry to monitor SpO2 will reduce the need to count respiratory.	Strongly agree	37 (27.8%)
	Agree	56 (42.1%)
	Neutral	18 (13.5%)
	Agree	17 (12.8%)
	Strongly disagree	5 (3.8%)
I usually record respiratory rate as standard rate between 12 and 20/min if SpO2 is within normal range.	agree	27 (20.3%)
	Agree	60 (45.1%)
	Neutral	21 (15.8%)
	Disagree	19 (14.3%)
	Strongly disagree	6 (4.5%)

Discussion

This study assessed the knowledge and attitudes of nursing students regarding vital sign monitoring in a tertiary care hospital in Pakistan. The findings revealed moderate levels of knowledge, with gaps in the ability to interpret changes in vital signs and relate them to underlying clinical conditions. Attitudes were generally positive but indicated reliance on routine documentation and technology rather than manual assessment. A comparison with previous studies highlights several similarities and differences, providing a broader understanding of the challenges and opportunities in improving nursing competencies in vital sign monitoring.

The study found that 58.6% of participants agreed they could relate vital signs to pathophysiology, while 53.4% acknowledged limited knowledge in identifying clinical deterioration. These results align with those reported by Ahmed et al., who identified similar knowledge gaps among nursing students in Pakistan, emphasizing the need for integrating advanced clinical education into nursing curricula (11). Internationally, Lavelle et al. demonstrated that nursing students in developed countries exhibited higher competency levels due to structured simulation-based training, highlighting a disparity in educational methodologies (12).

Attitudinal findings from this study revealed that 45.1% of participants recorded respiratory rates as a standard range if SpO2 levels were normal. This aligns with findings from Khan and Rehman, who noted similar reliance on pulse oximetry among nurses in Pakistan, attributing it to resource limitations and high workloads (13). In contrast, Johnson et al. reported that nurses in high-income settings adhered more strictly to manual respiratory rate assessment protocols, reflecting the benefits of rigorous training and adequate staffing (14).

The practice-related gaps identified in this study, such as underutilization of manual monitoring techniques, are consistent with observations by Malik et al., who highlighted that reliance on technology often leads to neglect of manual assessment skills among nursing students in low-resource settings (15). Mwita et al. similarly reported that in African healthcare systems, limited resources and training opportunities resulted in suboptimal practices in vital sign monitoring, underscoring the global nature of this issue in resource-limited settings (16).

Educational qualifications and experience were significantly associated with better knowledge and attitudes in this study. Participants with advanced qualifications, such as BSN (Generic), demonstrated higher competency levels. This finding aligns with research by Zafar et al., who found that continuous professional development significantly improved nursing competencies in clinical practice (17). Globally, Kleinman et al. have emphasized that integrating advanced clinical skills training into undergraduate nursing education is essential for bridging competency gaps (18).

Systemic barriers, including inadequate training programs and high patient-to-nurse ratios, were highlighted in this study as major contributors to knowledge and practice gaps. These challenges resonate with findings by Ahmed and Khan, who advocated for policy reforms and increased investment in nursing education to address systemic deficiencies in Pakistan's healthcare system (19). In contrast, healthcare systems in high-income countries, as reported by Lavery et al., benefit from comprehensive training and institutional support, leading to better patient outcomes (20).

Conclusion

In conclusion, this study underscores the need for targeted educational interventions, regular competency assessments, and systemic reforms to enhance nursing students' knowledge and attitudes toward vital sign monitoring. Addressing these gaps through simulation-

based training and evidence-based practices can improve the quality of nursing care and patient safety outcomes.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department Concerned. (IRBEC-SNU-0552/23)
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Conflict of interest

The authors declared absence of conflict of interest.

Author Contribution

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Coordination of collaborative efforts. Manuscript drafting. Study Design, Review of Literature.
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Conception of Study, Final approval of manuscript.
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Coordination of collaborative efforts.
Data acquisition, and analysis.

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