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ASSESSING KNOWLEDGE AND ATTITUDES OF NURSING STUDENTS TOWARD SAFE BLOOD TRANSFUSION PRACTICES IN SRI GANGANAGAR, RAJASTHAN

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ABSTRACT

Introduction: Safe blood transfusion is vital in healthcare, and nursing students must develop strong knowledge and attitudes to ensure patient safety. Errors in transfusion can have severe consequences, emphasizing the need for effective education. **Method:** This cross-sectional study assessed 60 third- and fourth-year nursing students in Sri Ganganagar, Rajasthan. A structured questionnaire evaluated their demographics, knowledge of transfusion protocols, and attitudes towards transfusion safety. Data were analyzed using SPSS with Chi-square tests for associations between demographic factors and knowledge/attitudes. **Results:** 50% of students had moderate knowledge, 30% good, and 20% poor. Attitudes were also varied, with 46.67% moderate, 28.33% good, and 25% poor. No significant demographic associations were found between knowledge and attitude. **Conclusion:** Nursing students exhibited moderate knowledge and attitudes toward transfusion safety. Continuous education and simulation training are essential to improving their competencies. Further research should focus on enhancing educational strategies to improve transfusion safety.

KEYWORDS: Blood transfusion safety, nursing students, knowledge, attitudes, patient safety, healthcare education.

INTRODUCTION

Safe blood transfusion practices are a critical component of healthcare, ensuring that patients receive compatible blood with minimal risk of complications. Nursing students, who are future healthcare professionals, must possess the knowledge and attitude to administer blood transfusions effectively.[1] Ensuring their competence in blood transfusion safety has long-term implications for patient care quality and safety.[2]

A global study found that registration errors in transfusion patients occur at a rate of 5.74 errors per 10,000 samples, with 85.7% having potentially severe consequences, especially in outpatient clinics and emergency departments.[3] Another study highlighted challenges in reporting transfusion-related adverse events, showing that these events significantly impact patient outcomes across regions.[4] Furthermore, 61% of countries, particularly in low-income regions, face a substantial gap between blood supply and need, with over 100 million units unmet annually, especially in sub-Saharan Africa and South Asia.[5]

Numerous studies have highlighted gaps in nurses' knowledge and the importance of continuous training to prevent errors during transfusion. Blood transfusion is associated with significant risks, including transfusion reactions and errors, which make it crucial for healthcare providers to have a strong foundation in transfusion protocols.[6]

A study conducted by Smith et al. (2010) emphasized the importance of standardized teaching programs to improve student nurses' knowledge of safe transfusion

practices. This study revealed that while students initially achieved a wide range of knowledge scores, knowledge retention declined over time, underlining the need for continuous reinforcement.[7]

Blood transfusion errors, such as incorrect blood group transfusion or failure to recognize transfusion reactions, pose a significant risk to patient safety. Mole et al. (2007) evaluated a teaching pack for nursing students that significantly improved their knowledge of blood transfusion administration and emphasized the importance of proper bedside checks to prevent these errors.[8]

The significance of reinforcing knowledge through regular in-service training has been a common theme in the literature. Donaldson et al. (2008) and Brown (2023) both argued that continuous education is necessary to maintain nurses' competencies in blood transfusion, particularly for those who do not frequently encounter transfusion situations in clinical practice. Brown (2023) further elaborated that simulation training, along with regular drop-in sessions, is essential to fill knowledge gaps exacerbated by limited clinical exposure during the COVID-19 pandemic.[9,10]

In conclusion, the current study seeks to assess the knowledge and attitudes of nursing students regarding safe blood transfusion practices. By understanding the gaps and strengths in their knowledge, this study aims to contribute to the development of more effective educational programs that ensure patient safety and reduce the risk of transfusion-related errors.

METHODOLOGY

Study Design :- This study employed a cross-sectional descriptive design to assess the knowledge and attitudes of nursing students regarding safe blood transfusion practices.

Study Setting and Population:- The study was conducted at a nursing college in Sri Ganganagar, Rajasthan. The target population consisted of nursing students who were enrolled in their third and fourth years of study. A total of 60 students participated in the study.

Sampling Technique:- convenient sampling was used to select the study participants.

Data Collection Tools:- Data were collected using a structured questionnaire designed to assess the knowledge and attitudes of nursing students regarding safe blood transfusion practices.

- **Demographic Information**: This section gathered data on the participants' age, gender, year of study, previous blood donation experience in blood transfusion.
- **Knowledge Section**: This section consisted of multiple-choice questions assessing the students' knowledge of blood transfusion protocols, including pre-transfusion testing, blood grouping, and management of transfusion reactions.
- **Attitudes Section**: A 10-item Likert scale was used to assess the students' perceptions of the importance of blood transfusion safety and their attitudes towards adhering to transfusion protocols.

Ethical Considerations:- Ethical approval for the study was obtained from the principal of the institution. All participants were informed about the purpose of the study, and their participation was entirely voluntary. Written informed consent was obtained from each participant before data collection.

Data Analysis:- The collected data were entered into SPSS and analyzed using descriptive and inferential statistics.

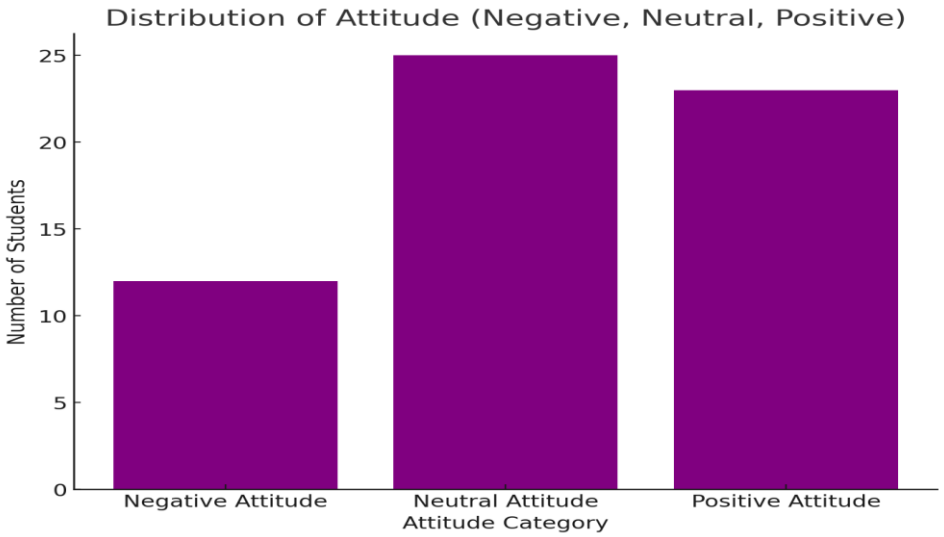
RESULT

Table 1: Demographic Characteristics of the Participants.

Demographic Variable	Category	N (%)
Age Categories	20-21 years	14 (23.33%)
	22-23 years	22 (36.67%)
	24+ years	12 (20%)
Gender	Male	27 (45%)
	Female	33 (55%)
Year of Study	3rd Year	29 (48.33%)
	4th Year	31 (51.67%)
Previous Blood Donation	Yes	18 (30%)
	No	42 (70%)
Residence Type	Urban	26 (43.33%)
	Rural	34 (56.67%)

Table 2: Knowledge and Attitude Categories.

Category	Frequency (N)	Percentage (%)	Mean SD
Attitude category			8.7 ± 2.2
Negative Attitude	12	20.00	
Neutral Attitude	25	41.67	
Positive Attitude	23	38.33	
Knowledge category			3.8 ± 1.3
Poor Knowledge	18	30.00	
Average Knowledge	26	43.33	
Good Knowledge	16	26.67	



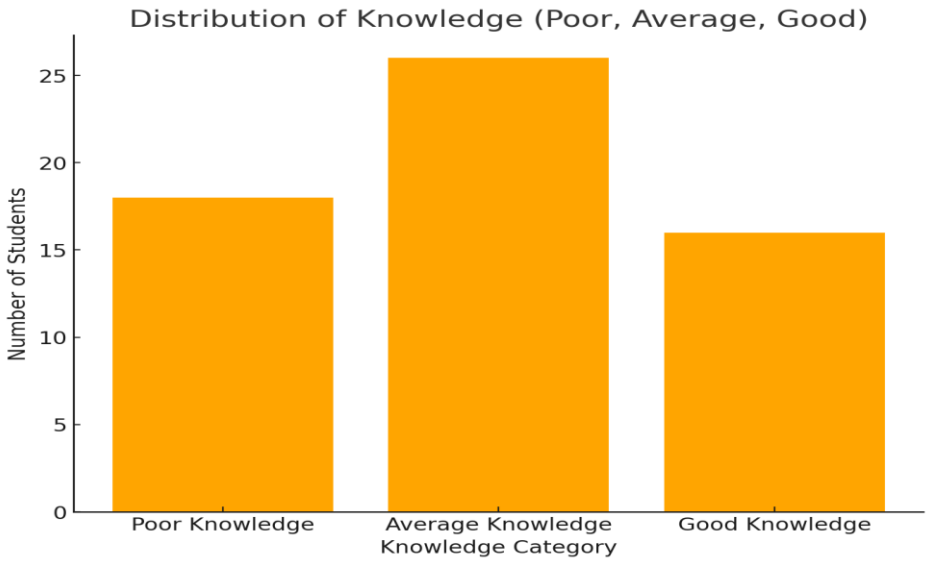


Table 3: Chi-square Test Results for Demographic Variables vs. Knowledge and Attitude.

Demographic Variable	Knowledge (Chi2, p-value)	Attitude (Chi2, p-value)
Age Category	3.45 (0.18) ^{NS}	2.89 (0.24) ^{NS}
Year of Study	2.39 (0.30) ^{NS}	1.83 (0.40) ^{NS}
Gender	3.12 (0.21) ^{NS}	2.67 (0.26) ^{NS}
Previous Blood Donation	4.05 (0.13) ^{NS}	3.48 (0.18) ^{NS}
Residence Type	2.14 (0.34) ^{NS}	1.95 (0.37) ^{NS}

* = significant ^{NS}= non significant

DISCUSSION

The present study revealed that nursing students demonstrated moderate knowledge and attitudes towards safe blood transfusion practices. This finding aligns with previous studies, where students' knowledge retention was found to be variable, with moderate performance in critical areas such as the management of transfusion reactions and pre-transfusion testing. For instance, the study by Mole et al. (2007) found that while structured educational programs improved knowledge immediately after training, students struggled with long-term retention of critical transfusion safety protocols.[8]

The mean knowledge score of 8.7 ± 2.2 in this study indicates a moderate understanding of blood transfusion protocols. This is consistent with findings from Encan and Akin (2019), where moderate knowledge levels were observed, particularly in relation to critical aspects like transfusion reactions and set changes.[11] This study supports the findings of Flood and Higbie (2016), who found that students who underwent simulation-based training, reinforced with lectures, showed significant improvement in their cognitive understanding of transfusion protocols.[12] Similarly, our findings indicate that nursing students possess moderate knowledge, suggesting that simulation and structured education may improve knowledge retention and practical application.

The current study also contrasts with results from Brown (2023), who noted that the absence of regular transfusion practice due to clinical limitations (e.g., the COVID-19 pandemic) further exacerbates knowledge gaps in transfusion safety.[9] This difference could be attributed to variations in the availability of practical exposure and the frequency of in-service training programs across study settings.

In our study, we found no significant associations between demographic factors and knowledge or attitudes towards blood transfusion, which contrasts with several other studies. Tavares et al. (2015)[13] and Soliman & Elhapashy (2021)[14] both found significant associations between professional training and increased knowledge in transfusion safety among nurses, highlighting the importance of formal training (Tavares et al., 2015); (Soliman & Elhapashy, 2021). Similarly, Iqbal (2021) found associations between clinical experience and knowledge, supporting the role of practical exposure.[15] Cicolini et al. (2019) observed that prior blood donation experience was linked to positive attitudes, which differs from our findings where no such association was observed.[16]

The strengths of this study include its focus on both third and fourth-year nursing students, providing a comprehensive overview of knowledge at different stages of nursing education. The study's use of both knowledge and attitude assessments offers a holistic view of students' competence in transfusion safety. However, limitations include the use of convenient sampling, which may limit the generalizability of the findings. Furthermore, the study's cross-sectional design captures knowledge at a single time point, which does not account for changes over time. In conclusion, while nursing students demonstrated moderate knowledge and attitudes towards safe transfusion practices, continuous education, particularly through simulation and hands-on practice, is essential to improving their competence. This study highlights the need for regular reinforcement of transfusion protocols to ensure patient safety and prevent transfusion-related errors.

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