

Understanding Needle Stick Injuries among First-Year Nursing Students

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Abstract: *Needle stick injuries (NSIs) present a significant occupational risk for healthcare workers, particularly nursing students globally. This study aimed to evaluate the level of awareness and knowledge regarding NSIs among first-year nursing students across different programs in Cuttack. A total of 60 students participated, with 20 each from ANM, GNM, and B.Sc. Nursing programs. Using a structured questionnaire, the study found that 82% of participants had poor knowledge about NSIs, 17% had average knowledge, and only 1% demonstrated good knowledge. The results indicate a serious gap in understanding NSI risks and highlight the need for enhanced educational initiatives. To address this issue, it is crucial to implement comprehensive training programs that focus on prevention, management, and safe practices related to needle stick injuries in the educational sector. Improving knowledge in these areas is essential to reduce the risk of NSIs and ensure the safety of nursing students as they enter the healthcare field.*

Keywords: healthcare education, knowledge assessment, Needle stick injuries, nursing students, occupational hazards.

1. Introduction

Needle stick injuries (NSIs) are a significant concern for healthcare professionals, including nursing students, due to the risk of transmitting blood-borne pathogens such as hepatitis B, hepatitis C, and HIV. The prevalence of NSIs is particularly high in developing countries, necessitating effective preventive measures and comprehensive knowledge among healthcare workers. Nursing students, especially those in their initial stages of clinical training, are highly vulnerable to NSIs. This study assesses the knowledge of NSIs among first-year ANM, GNM, and B.Sc. Nursing students in selected colleges in Cuttack.

2. Need for the study

NSIs represent a severe health hazard, with potential infections from life-threatening pathogens. It is essential to evaluate the knowledge levels of nursing students to develop targeted educational strategies that enhance safety practices and reduce NSI incidents.

Objectives of the study

- 1) Assess the knowledge levels of first-year ANM, GNM, and B.Sc. Nursing students regarding NSIs.
- 2) Compare knowledge levels among the three groups.
- 3) Identify knowledge gaps to inform future educational strategies.

3. Review of Literature

Danasu, R., and Rajesh, A. (2019) studied the impact of a Hands-on Clinical Training Program on needle stick injuries and safety measures among student nurses at SMVNC, Puducherry. Their research, published in the International Journal of Advances in Nursing Management, showed that the training significantly improved the students' knowledge

and practices regarding needle stick injury prevention and management. The study highlights the value of practical training in nursing education to reduce risks and improve safety in clinical settings. The authors recommend incorporating such training programs into the nursing curriculum to better prepare students for real-world healthcare environments.

The study by Danasu and Rajesh (2019) focused on reducing needle stick injuries (NSIs) among student nurses at SMVNC, Puducherry, using a pre-experimental one-group pre-test and post-test design. Over six weeks, 400 student nurses were assessed on their knowledge and skills related to NSIs using a questionnaire and a checklist. Before the training, 68.2% of students had moderate knowledge, and 31.8% had inadequate knowledge, with a mean score of 14.9. Post-training, 51.5% had moderate knowledge, and 48.5% had adequate knowledge, with a mean score of 25.0. In terms of skills, 57.8% were not competent, and 42.3% had low competence pre-training, with a mean score of 6.73. After the training, 60.5% had high competence, and 39.5% had low competence, with a mean score of 12.0. The study demonstrates the effectiveness of hands-on clinical training in improving both knowledge and skills related to NSI prevention and management among nursing students.

Sanjay Kumar Kulchania (2021) Occupational hazards harm individual health and safety and affect organizational effectiveness. These hazards can be physical, such as injuries, accidents, ergonomic problems, chemical exposure, communicable diseases, and workplace violence. They can also be psychological, including stress from workload, staffing issues, role conflicts, emotional demands, leadership styles, and professional conflicts. To address these issues, strategies like The Factories Act of 1948, The Employees State Insurance Act of 1948, TNAI's role, and Stress Management Programs (SMI) are used. Nursing administrators should implement universal precautions, use

protective equipment, ensure HBV vaccinations, adopt needleless systems and non-latex gloves, provide regular breaks, create a safe work environment, and use safe patient lifting devices. Organizations should work to eliminate physical hazards and reduce workplace stress to improve individual well-being and organizational effectiveness.

Needle stick injuries (NSIs) pose a serious occupational risk for healthcare workers, particularly in developing countries where protective measures are often insufficient. Wilburn and Eijkemans (2013) underscored the necessity of preventive strategies and international collaborations, like those between the World Health Organization (WHO) and the International Council of Nurses (ICN), to globally reduce NSIs among healthcare workers.

Devi et al. (2014) investigated the awareness of NSIs among paramedical and housekeeping staff, revealing significant knowledge gaps and highlighting the need for targeted educational programs. Trivedi (2013) similarly stressed the importance of comprehensive training for nursing students to mitigate NSI risks.

In a study by Yaahab et al. (2003), the incidence of NSIs among medical students was examined, identifying key contributing factors and recommending enhanced educational interventions to improve safety practices. Beekmann and Henderson (2005) discussed various strategies to protect healthcare workers from bloodborne pathogens, emphasizing the need for proper training and the use of protective equipment.

Research by Guo et al. (2002) in Taiwan estimated the risk of blood-borne pathogen transmission following NSIs, highlighting the critical need for effective prevention and management strategies. Memish et al. (2013) analyzed risk factors associated with NSIs in a Saudi Arabian tertiary care hospital, suggesting improvements in reporting mechanisms and protective measures.

Rele and Mathur (2002) studied the prevalence of NSIs among healthcare workers in India, stressing the urgent need for better safety protocols and training programs. Sharma et al. (2010) examined the prevalence and responses to NSIs among healthcare workers in a Delhi hospital, identifying significant gaps in knowledge and practice that require immediate attention.

Finally, Kapoor et al. (2013) conducted a systematic review of NSI awareness among dental professionals in India, emphasizing the critical role of education and training in reducing NSI risks. Collectively, these studies highlight the importance of robust educational initiatives and effective safety protocols to protect healthcare workers from NSI hazards.

4. Methodology

This quantitative, descriptive study involved 60 first-year nursing students (20 ANM, 20 GNM, and 20 B.Sc. Nursing) from colleges in Cuttack, selected through convenience sampling. Data were collected using a structured

questionnaire designed to assess knowledge about NSIs. Descriptive statistics were used for data analysis.

5. Findings of the Study

Table 1: Frequency and Percentage Distribution of Knowledge Levels

Knowledge Level	ANM (N=20)	GNM (N=20)	B.Sc. Nursing (N=20)
Good	0 (0%)	1 (5%)	0 (0%)
Average	2 (10%)	3 (15%)	2 (10%)
Poor	18 (90%)	16 (80%)	18 (90%)

Table 2: Mean and Standard Deviation of Knowledge Scores

Knowledge Area	ANM	GNM	B.Sc. Nursing
Mean Score	7.5	8.2	7.7
Standard Deviation	1.2	1.4	1.3

6. Discussion

The study highlights a critical deficiency in the knowledge of NSIs among first-year nursing students, with the majority demonstrating poor understanding. The slight variations between ANM, GNM, and B.Sc. Nursing students suggest a universal need for enhanced educational programs across all nursing disciplines.

7. Conclusion

The results underscore the urgent need for comprehensive educational interventions to improve NSI knowledge among nursing students. Addressing these gaps is vital for enhancing student safety and reducing the incidence of NSIs.

8. Implication

Nursing Practice

Enhanced training on NSI prevention and management should be integrated into clinical practice sessions to ensure students are well-prepared to handle such incidents.

Nursing Education

Curricula should be updated to include detailed modules on NSI risks, prevention, and management, emphasizing practical, hands-on training.

Nursing Administration

Administrators should implement regular training workshops and ensure the availability of protective equipment and reporting mechanisms for NSIs.

Nursing Research

Further research is needed to evaluate the effectiveness of educational interventions on NSI prevention and to explore innovative teaching methods.

9. Recommendation

- 1) Implement targeted educational programs focusing on NSI prevention and management.
- 2) Conduct regular assessments to monitor knowledge retention and application.

- 3) Enhance reporting systems and provide immediate support for NSI incidents.

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