



“Knowledge, Attitude and Practice (KAP) of Needle-stick Injury among Healthcare Staff at selected Rural Tertiary care Teaching Hospital”

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ABSTRACT-

Background of the Study- Needle-stick injuries (NSIs) are one of the common occupational hazards among healthcare workers and may expose them to serious blood-borne infections such as Hepatitis B, Hepatitis C, and Human Immunodeficiency Virus (HIV). Knowledge, attitude, and safe practices regarding NSI prevention play an important role in reducing occupational exposure and promoting workplace safety.

Objectives-

1. To evaluate knowledge on NSI causes, risks, and prevention.
2. To assess attitudes toward reporting and prevention of NSI.
3. To evaluate practices related to NSI prevention and post-exposure response.

Material and Methods- A hospital-based cross-sectional quantitative study was conducted among 172 healthcare staff using stratified random sampling. Data was collected using a structured and pretested questionnaire consisting of demographic details and KAP components. Data was entered in Microsoft Excel and analyzed using R software using descriptive and inferential statistics

Results The mean age of participants was 36.72 ± 8.03 years, and the mean years of experience were 12.91 ± 6.89 years. Many participants were male (62.2%). The mean knowledge score was 9.59 ± 0.54 and all participants (100%) demonstrated good knowledge regarding needle-stick injuries. The mean attitude score was 41.27 ± 2.47 and 89.5% participants showed a positive attitude. The mean practice score was 36.03 ± 2.63 and most participants (81.4%) demonstrated moderate practice regarding prevention and post-exposure response. A statistically significant association was observed between practice level and designation ($p < 0.05$).

Key Words- Needle-stick injury, Knowledge, Attitude, Practice, Healthcare staff, Occupational safety, Prevention

I.INTRODUCTION

Healthcare workers (HCWs) play a vital role in patient care but are constantly exposed to various occupational hazards, including exposure to blood and body fluids through needle-stick and sharps injuries (NSIs). A needle-stick injury is defined as the accidental puncture of the skin by a needle or other sharp object contaminated with blood or body fluids from another person. (1) Such injuries may occur during procedures like blood collection, injections, suturing, or improper disposal of needles and sharps. They pose a major public health concern because they can transmit serious blood-borne pathogens, primarily Hepatitis B virus (HBV), Hepatitis C virus (HCV), and the Human Immunodeficiency Virus (HIV). (2)

Globally, the World Health Organization (WHO) estimates that more than 3 million healthcare workers experience percutaneous exposure to blood-borne pathogens annually, leading to thousands of cases of HBV, HCV and HIV infections.(3) In developing countries like India, the burden is considerably higher due to factors such as high patient load, inadequate staffing, lack of awareness, poor adherence to universal precautions, and inadequate occupational health programs.(4) Studies have shown that nurses and paramedical staff are particularly at risk, followed by medical students, laboratory personnel, and housekeeping staff who handle contaminated waste.(5)

Needle-stick injuries are preventable, yet they continue to occur frequently in hospitals. Several reasons contribute to their occurrence such as recapping of used needles, lack of attention during procedures, improper handling of sharps, absence of safety devices, and over-crowded working conditions. Improper waste segregation and disposal practices further increase the risk of accidental pricks. The fear and anxiety following an injury can lead to psychological distress among healthcare workers, especially due to the perceived risk of HIV infection. Despite the existence of guidelines and policies for post-exposure prophylaxis (PEP), many incidents go unreported, either because workers are unaware of reporting mechanisms, perceive the injury as minor, or fear punitive actions or stigmatization.

I.1 Statement of Problem- A study to assess the Knowledge, Attitude, and Practice regarding Needle-stick Injuries among healthcare staff at a selected Rural Tertiary Teaching Hospital.

I.2 Objectives-

1. To evaluate knowledge on NSI causes, risks, and prevention.
2. To assess attitudes toward reporting and prevention of NSI.
3. To evaluate practices related to NSI prevention and post-exposure response.

II.METHODOLOGY

II.1 Research design and approach

A cross-sectional study design is used in this study.

II.2 Setting of the study

This study was at a selected Rural Tertiary Teaching Hospital located in rural Maharashtra, India.

II.3 Sample

The Sample for the study comprised of all healthcare staff working at the selected Rural Tertiary Teaching Hospital

II.4 Sample size

The total number of samples selected for the study was 172.

II.5 Sampling technique

The sampling technique used in the study was a stratified random sampling method

II.6 Sampling Procedure

Samples were screened for eligibility of inclusion and exclusion criteria. Patients eligible and willing to participate were included in the study.

II.7 Inclusion and Exclusion criteria

Inclusion criteria: The patient who are;

- Healthcare staff who had worked for at least one month at the selected Rural Tertiary Teaching Hospital.
- Healthcare staff who were willing to participate in the study and provide informed consent.

Exclusion criteria: The patients who are;

- Healthcare staff who were on long leave during the period of data collection.
- Administrative staff and other personnel are not directly involved in clinical procedures or handling of needles and sharps.

II.8 Tools and techniques

Data was collected using a structured and pretested questionnaire adapted from previously published Knowledge, Attitude, and Practice (KAP) studies related to needle-stick injuries among healthcare workers. The questionnaire consisted of four sections:

Section A: Socio-demographic and Occupational Information

Included age, gender, designation, department, years of experience, and work-related details.

Section B: Knowledge Assessment

Included questions related to causes of needle-stick injuries, infection transmission risks (HBV, HCV, HIV), post-exposure prophylaxis (PEP), hepatitis B vaccination, and safe handling and disposal of sharps. Knowledge was assessed through multiple-choice and true/false questions.

Section C Attitude Assessment:- Included statements measured using a 5-point Likert scale to assess

participants' attitudes toward reporting, prevention, perceived seriousness, and usefulness of training and safety measures.

Section D Practice Assessment: -

Included questions regarding reporting behavior, post-exposure response, use of gloves, vaccination status, sharps disposal practices, recapping behavior, and history of needle-stick injuries during the previous 12 months.

II. 9 Data collection procedure

After obtaining ethical approval and institutional permission, data collection was conducted among healthcare staff working at the selected Rural Tertiary Teaching Hospital during the study period.

Participants fulfilling the inclusion criteria were approached and informed about the purpose of the study. Written informed consent was obtained before participation. The structured questionnaire was distributed to participants and completed during the data collection period. Confidentiality and anonymity were maintained throughout the study.

II.10 Data Analysis

Data analysis was performed using Microsoft Excel and R software.

Descriptive statistics including frequency, percentage, mean, standard deviation, median, and graphical presentation were used to summarize socio-demographic characteristics and KAP responses. Knowledge, attitude, and practice scores were calculated and categorized according to predefined scoring criteria. Inferential statistics such as the Chi-square test were applied to identify associations between selected demographic variables and KAP levels.

A p-value of less than 0.05 was considered statistically significant.

III Results

Demographic Characteristics of Participants

Table 4.1 Distribution of Participants According to Demographic Characteristics (N = 172)

Characteristic	Overall N = 172 ¹	Female N = 65 ¹	Male N = 107 ¹	p-value ²
Age (Years)	37 (8)	37 (9)	37 (7)	0.7
Designation				0.5
Laboratory Personnel	95 (55%)	34 (52%)	61 (57%)	
Nurse	77 (45%)	31 (48%)	46 (43%)	
Department				0.9
Clinical Department	76 (44%)	30 (47%)	46 (43%)	
Laboratory Department	90 (53%)	32 (50%)	58 (54%)	
Other	5 (2.9%)	2 (3.1%)	3 (2.8%)	
Years of Experience	13 (7)	14 (7)	12 (7)	0.4
¹ Mean (SD); n (%)				
² Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test				

Interpretation of Table: Demographic Characteristics of Participants

A total of 172 healthcare staff participated in the study, including 107 (62.2%) males and 65 (37.8%) females. The mean age of participants was 37 ± 8 years, with no statistically significant difference in age distribution between males and females ($p = 0.7$). Regarding designation, many participants were Laboratory Personnel (55%), followed by Nurses (45%), and there was no significant association between designation and gender ($p = 0.5$). Most participants belonged to the Laboratory Department (53%), while 44% were from Clinical Departments and 2.9% from other departments, with no significant difference observed across gender groups ($p = 0.9$). The mean years of experience among participants was 13 ± 7 years, and the difference in experience between male and female participants was also not statistically significant ($p = 0.4$). Overall, the demographic characteristics were comparable across gender categories and did not show any statistically significant variation ($p > 0.05$).

Objective 1-To evaluate knowledge on NSI causes, risks, and prevention

Table 4.2 Knowledge Score and Knowledge Level Regarding Needle-stick Injuries (N = 172)**A. Knowledge Score Distribution**

Statistic	Value
Mean $\pm$ SD	9.59 $\pm$ 0.54
Median	10
Minimum	8
Maximum	10

B. Knowledge Level

Knowledge Level	Frequency	Percentage (%)
Poor	0	0
Average	0	0
Good	172	100

Interpretation:

The findings showed that the mean knowledge score was 9.59 ± 0.54 , with a median score of 10. The minimum and maximum scores ranged from 8 to 10, indicating consistently high knowledge scores among participants. Knowledge level categorization showed that all participants (100%) demonstrated good knowledge regarding causes, risks, prevention, reporting, and management of needle-stick injuries. No participant was categorized under average or poor knowledge level. Since all participants belonged to a single knowledge category, inferential analysis using Chi-square could not be interpreted.

Inference:

The study indicates that healthcare staff possessed adequate knowledge regarding needle-stick injury prevention and occupational safety practices.

Objective-2

To assess attitudes toward reporting and prevention of NSI

Table 4.3 Attitude Score and Attitude Level Regarding Needle-stick Injuries (N = 172)**A. Attitude Score Distribution**

Statistic	Value
Mean $\pm$ SD	41.27 $\pm$ 2.47

Median	42
Minimum	34
Maximum	48

B. Attitude Level

Attitude Level	Frequency	Percentage (%)
Poor	0	0
Moderate	18	10.5
Positive	154	89.5

Interpretation:

The mean attitude score was 41.27 ± 2.47 with scores ranging from 34 to 48. Most healthcare staff demonstrated favorable attitudes toward reporting and prevention of needle-stick injuries. Among participants, 89.5% showed a positive attitude while 10.5% demonstrated a moderate attitude. No participant had poor attitude scores. Chi-square analysis could not be interpreted because one category had insufficient observations.

Inference:

The findings suggest that healthcare staff had a positive perception toward reporting systems, preventive measures, and occupational safety practices.

OBJECTIVE 3

To evaluate practices related to NSI prevention and post-exposure response Table 4.4 Practice Score and Practice Level Regarding Needle-stick Injuries (N = 172)

A. Practice Score Distribution

Statistic	Value
Mean $\pm$ SD	36.03 ± 2.63
Median	36
Minimum	10
Maximum	46

B. Practice Level

Practice Level	Frequency	Percentage (%)
Poor	1	0.6
Moderate	140	81.4
Good	31	18.0

Inferential Analysis: Chi-square test showed a statistically significant association between practice level and designation.

$$\chi^2 = 16.881 \quad df = 2 \quad p = 0.000216$$

Interpretation:

The mean practice score was 36.03 ± 2.63 indicating an overall moderate level of practice regarding prevention and post-exposure response. The majority of participants (81.4%) demonstrated moderate practice, followed by 18.0% with good practice and only 0.6% with poor practice. Chi-square analysis revealed a statistically significant association between practice level and designation ($p < 0.05$). Therefore, the null hypothesis was rejected and the research hypothesis was accepted.

Inference: This indicates that preventive practices related to needle-stick injuries differed across staff designations.

Overall Interpretation of Findings

The study findings indicate that healthcare staff possessed excellent knowledge and positive attitudes regarding needle-stick injuries. However, actual preventive practices remained predominantly moderate. This suggests that although awareness levels were high, there is still scope for strengthening implementation of preventive measures and post-exposure practices through continuous training and monitoring.

IV Discussion

The study demonstrates that healthcare staff possessed strong theoretical understanding and favorable perceptions regarding needle-stick injury prevention. However, actual preventive behavior remained moderate. This difference between knowledge and practice suggests that awareness alone may not ensure consistent safe behavior in clinical settings. Factors such as workload, routine practices, time pressure, availability of safety equipment, and reporting behavior may influence practical implementation.

The significant association between practice and designation suggests that occupational roles and work responsibilities may influence adherence to preventive measures.

Key Findings (Summary)

- Total participants included in the study were 172 healthcare staff.
- Mean age of participants was 36.72 ± 8.03 years.
- Mean years of experience was 12.91 ± 6.89 years.
- All participants (100%) demonstrated good knowledge regarding needle-stick injuries.
- Most participants (89.5%) demonstrated positive attitudes toward prevention and reporting.

- Majority of participants (81.4%) demonstrated moderate practice regarding prevention and post-exposure response.
- A statistically significant association was found between practice level and designation ($p < 0.05$).
- Knowledge and attitude did not show interpretable inferential association due to limited category variation.

V. Conclusion

The present study concluded that healthcare staff working at the selected Rural Tertiary Teaching Hospital demonstrated excellent knowledge and positive attitudes regarding needle-stick injury prevention and reporting. However, preventive practices and post-exposure responses remained predominantly moderate despite favorable awareness levels. A statistically significant association was observed between practice and designation. Therefore, strengthening practical training, improving reporting mechanisms, and reinforcing infection prevention measures are essential to promote safer clinical practices and reduce occupational exposure.

Declaration by Authors

Ethical approval: The present study was approved by the Institutional Ethics Committee of School of Public Health and Social Medicine, PIMS-DU, Loni, Ref-PIMS/SPHSM/IRC/2026/449/18

Acknowledgement: None

Sources of Fundings: None

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

1. Pavithran V, et al. Knowledge, attitude and practice of needle stick injuries among dental professionals in Bangalore. *[Article on PMC]*. 2015.
2. Gupta D, et al. Study of knowledge, attitude and practice of needle stick injuries among nurses. *Int J Community Med Public Health*. 2019;6(2):865–869.
3. Al-Khalidi GZS, et al. Knowledge, Attitudes and Practice Regarding Needle Stick Injuries Among Health Care Workers. *Maced J Med Sci*. 2022.
4. Madhavan A, et al. Comparison of knowledge, attitude and practices regarding ... *J Family Med Prim Care*. 2019. (Paper summarizing NSI prevalence and KAP comparisons).
5. Agrawal T, et al. Occupational Exposure to Needle Stick Injuries among Health Care Personnel in a Tertiary Care Hospital: A cross-sectional study. 2022.
6. MSJ Online (Kumar A, et al.). A study on needle stick injuries among health care workers. *MSJ Online / IJRMS* 2019.

7. Dafaalla MD, et al. Knowledge, attitude and practice towards needle stick injury among health care workers in a tertiary Sudanese hospital. *Texila Int J Clin Res.* (date).
8. KAP study on needlestick injuries — Anupriya et al. (KAP study review / pdf).
ejmanager / other open access. (various contexts).
9. National / regional KAP surveys and recent 2024–2025 articles assessing nurses' KAP (examples include Cureus and IJCMPPH studies that used structured pretested questionnaires and reported PEP/vaccination gaps).
10. Recent facility-based prevalence paper in IJMR Online giving prevalence & context for India (2025): *IJMR Online.* 2025.**Blaymore Bier JA, et al.** Comparison of skin-to-skin contact with standered contact in low-birth-weight infant who is breastfeed. *Archive of pediatrics & adolescents medicine*, 1996, 150:1265-1269.

