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A STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING NEEDLE-STICK INJURIES AMONG HEALTHCARE WORKERS IN A TERTIARY CARE HOSPITAL

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ABSTRACT **Background:** Needle-stick injuries (NSIs) pose occupational risks to healthcare workers (HCWs) through potential transmission of blood-borne infections. Assessing knowledge, attitudes, and practices (KAP) helps identify gaps in occupational safety. **Aim:** To assess KAP regarding NSIs among HCWs at Government General Hospital, Kadapa, Andhra Pradesh. **Materials and Methods:** A prospective cross-sectional study was conducted over three months among 215 HCWs. Data were collected using a structured questionnaire assessing NSI-related knowledge, attitudes, and practices. **Results:** Postgraduates recorded the highest knowledge (95%), attitude (98%), and practice (74%) scores, while biomedical-waste handlers scored lowest (90.5%, 94%, and 67%, respectively). Needle recapping was reported by 55–59%, and hepatitis B vaccination completion ranged from 79% to 84%. **Conclusion:** Despite satisfactory knowledge and attitudes, preventive practices require improvement, particularly among biomedical-waste handlers. Targeted training, safe sharps handling, timely reporting, and improved hepatitis B vaccination coverage are essential to strengthen occupational safety.

KEYWORDS : Needle-stick Injury; Occupational Exposure; Post-Exposure Prophylaxis.

INTRODUCTION

Needle-stick injuries (NSIs) are a significant occupational hazard among healthcare workers (HCWs), particularly those involved in injections, blood collection, surgical procedures, and sharps handling. These injuries may transmit blood-borne pathogens, including hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV), posing an important occupational health concern.[1]

The risk of infection depends on factors such as injury depth, blood exposure, and the source patient's infection status.[2] Despite available preventive measures, NSIs continue to occur due to unsafe needle handling, recapping, improper sharps disposal, inadequate adherence to standard precautions, and poor awareness of reporting protocols.[3]

Knowledge, attitudes, and practices (KAP) are crucial in preventing NSIs and ensuring appropriate post-exposure management. Awareness of pathogen transmission, hepatitis B immunisation, immediate first aid, risk assessment, post-exposure prophylaxis (PEP), and follow-up testing is essential. Prompt reporting and a positive attitude towards occupational safety facilitate timely evaluation and intervention.[4]

Previous studies have highlighted the burden of NSIs among healthcare personnel and the importance of preventive practices and appropriate post-exposure responses.[5] [6] Established infection-prevention guidance also emphasises standard precautions, safe sharps disposal, hepatitis B immunisation, and prompt reporting and management of occupational exposures.[7]

Despite these measures, gaps in knowledge, unsafe practices, and underreporting remain concerns. Assessing KAP across professional categories can identify areas requiring targeted training and institutional interventions. Therefore, this study aims to assess KAP regarding NSIs among interns, postgraduate trainees, staff nurses, and biomedical-waste handlers at a tertiary care hospital in Kadapa, Andhra Pradesh.

MATERIALS AND METHODS

Study Design and Setting: A prospective cross-sectional study was conducted at Government General Hospital (GGH), affiliated with Government Medical College, Kadapa, Andhra Pradesh, India, over three months following Institutional Ethics Committee (IEC) approval.

Study Population: Healthcare workers at risk of occupational exposure to needles and sharps, including interns, postgraduate medical students, staff nurses, and biomedical-waste handlers across hospital departments.

Sample Size: The sample size was calculated using \(n=Z^2p(1-p)/d^2\), with 95% confidence (\(Z=1.96\)), assumed prevalence of 18% based on Agrawal et al.[4], and 5% absolute precision. The minimum estimated sample size was 216 participants (calculated value: 215.52, rounded up).

Eligibility Criteria: Healthcare workers involved in patient care or handling sharps, with occupational exposure risk and willing to participate, were included. Those without relevant exposure or submitting incomplete questionnaires were excluded.

Data Collection: Data were collected using a pre-validated, structured questionnaire comprising demographic details and five questions each on knowledge, attitude, and practices (KAP). The domains assessed blood-borne infections, post-exposure management, HIV transmission risk, hepatitis B vaccination, reporting protocols, occupational risk perception, training, reporting behaviour, glove use, needle recapping, injury management, and sharps disposal.

Questionnaire Response Scale: Knowledge items used correct/incorrect responses; attitude items used a five-point Likert scale from strongly disagree to strongly agree; and practice items used always, sometimes, or never, with yes/no responses for relevant items.

Ethical Considerations: IEC approval was obtained before study initiation. Participation was voluntary, and informed consent was obtained from all participants.

RESULTS

Table 1 shows that interns constituted the largest participant group (33.5%), followed by postgraduate trainees (27.0%), staff nurses (21.9%), and biomedical-waste handlers (17.7%). Table 2 indicates that postgraduate trainees had the highest knowledge (95%), attitude (98%), and practice (74%) scores, whereas biomedical-waste handlers had the lowest scores. Table 3 shows high awareness of NSI-related risks and positive attitudes across all groups; however, unsafe needle recapping was reported by 55–59% of participants, while immediate wound washing and hepatitis B vaccination completion varied across professional categories. These findings highlight the need to strengthen safe practices and occupational injury prevention.

Table 1. Distribution of Study Participants by Professional Category

Professional category	Number (n)	Percentage (%)
Interns	72	33.5
Postgraduate trainees	58	27.0

Staff nurses	47	21.9
Biomedical-waste handlers (Class IV workers)	38	17.7
Total	215	100.0*

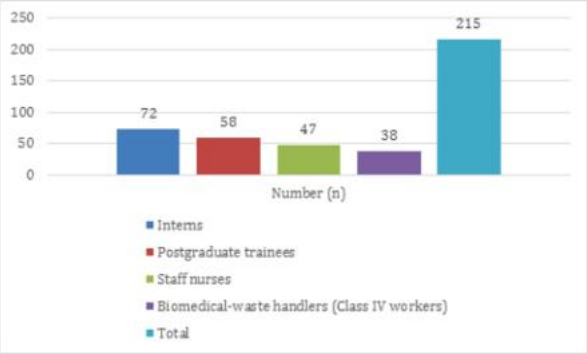

Table 2. Comparison of Knowledge, Attitude, and Practice (KAP) Scores Among Healthcare Workers

KAP domain	Interns (%)	Postgraduates (%)	Staff nurses (%)	Class IV workers (%)
Knowledge	93.0	95.0	92.0	90.5
Attitude	97.0	98.0	97.0	94.0
Practices	72.0	74.0	70.0	67.0

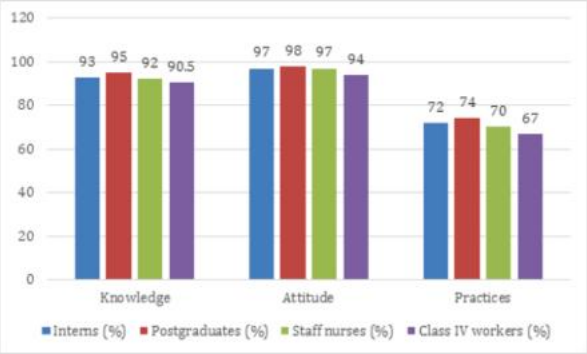

Table 3. Knowledge, Attitudes, and Practices Related to Needle-Stick Injuries

Parameter	Interns (%)	Post-graduates (%)	Staff nurses (%)	Class IV workers (%)
KNOWLEDGE				
Awareness of diseases transmitted through NSIs	97	98	96	95
Knowledge of recommended post-exposure measures	89	91	88	87
Knowledge of recommended hepatitis B immunisation	91	92	90	88
ATTITUDE				
Considered NSI a serious occupational hazard	97	98	96	93
Perceived NSIs as underreported due to fear or stigma	26	23	27	28
Supported training in standard precautions	98	99	97	95
PRACTICES				
Reported having experienced an NSI	3	1	3	5
Reported always recapping needles after use	56	55	59	57
Reported washing with soap and water immediately after an NSI	71	73	69	67
Reported completion of the three-dose hepatitis B vaccination course	83	84	82	79

DISCUSSION

Knowledge Regarding Needle-Stick Injuries

Knowledge scores were highest among postgraduate trainees (95%), followed by interns (93%), staff nurses (92%), and biomedical-waste handlers (90.5%). Madhavan et al. reported inadequate KAP among interns compared with nurses, emphasising the need for continued training.[8] A southern Indian study found that 89% of HCWs had good awareness of sharps disposal.[9] Although knowledge was satisfactory in the present study, the comparatively lower scores among biomedical-waste handlers indicate a need for targeted education.

Attitude Towards Reporting and Prevention

Attitude scores ranged from 94% among biomedical-waste handlers to 98% among postgraduate trainees. A tertiary care cardiac centre study reported that 94.7% of HCWs knew standard precautions and 91.5% were aware of NSI reporting procedures.[10] Conversely, a study from Assam found that only 21.1% of injured HCWs reported their injuries to the responsible medical officer.[11] This disparity suggests that awareness alone may not ensure reporting, which can be influenced by fear, stigma, and uncertainty regarding reporting procedures.

Practices Related to NSI Prevention

Practice scores were lower than knowledge and attitude scores, ranging from 67% among biomedical-waste handlers to 74% among postgraduate trainees. This indicates a gap between awareness and implementation of preventive measures. A New Delhi study reported needle recapping in 66.3% of 428 HCWs, while only 40% knew about institutional post-exposure prophylaxis (PEP) services.[12] Sharma et al. found that 34% of NSIs occurred during needle recapping, and only 7.8% of affected participants received HIV PEP.[13] These findings support eliminating needle recapping, ensuring safe sharps disposal, and strengthening awareness of timely post-exposure management.

Comparison with Other Indian Studies

Madhavan et al. reported a higher occurrence of NSIs among interns than nurses, whereas postgraduate trainees demonstrated the highest KAP scores in the present study.[8] These findings are not directly comparable because injury occurrence also depends on workload, procedural exposure, and experience. Sharma et al. reported that 79.5% of HCWs had experienced an NSI during their careers, with fatigue and recapping identified as contributing factors.[13] A Kochi study reported a 31% prevalence of NSIs in the preceding 12 months among 210 HCWs and highlighted delays in exposure screening and PEP.[14] Collectively, these findings emphasise preventive education, accessible reporting, and timely post-exposure care.

Implications for Biomedical-Waste Handlers

Biomedical-waste handlers had the lowest practice scores, highlighting potential gaps in occupational safety during waste collection, segregation, and transportation. Training should emphasise safe sharps handling, personal protective equipment, hepatitis B vaccination, and immediate injury reporting. A Sikkim study identified gaps in biomedical-waste management and recommended regular training for healthcare personnel and waste handlers.[15] Accordingly, support personnel should be routinely included in institutional infection-prevention programmes.

Regular training, particularly for groups with lower practice scores, should be prioritised. Clear reporting protocols, prompt exposure assessment, and timely indicated prophylaxis are essential. Future studies should examine associations between KAP scores and NSI occurrence and evaluate training effectiveness through pre- and post-intervention assessments. Multicentre studies could improve generalisability.

CONCLUSION

The study found generally satisfactory knowledge and attitudes toward needle-stick injury prevention among healthcare workers, but comparatively poorer preventive practices. Postgraduate trainees had the highest KAP scores, whereas biomedical-waste handlers had the lowest. These findings emphasize the need for regular training, safe sharps handling, timely incident reporting, hepatitis B vaccination, and adherence to post-exposure protocols to strengthen occupational safety across all healthcare worker categories.

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