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ORIGINAL RESEARCH

A Comprehensive Study on the Knowledge, Attitudes, and Practices of Needle stick injury among Healthcare Workers at a tertiary care hospital in Southern Karnataka

Anupama A[1], Sreeja S[2], Kavita N[3], Vidya R[4]

[1,2,3]Department of Microbiology, Akash Institute of Medical Sciences and Research Centre, Prasanahalli Main Road, Bengaluru Rural, India
[4]Department of Community Medicine, Akash Institute of Medical Sciences and Research Centre, Prasanahalli Main Road, Bengaluru Rural, India

Corresponding Author
Sreeja S
Department of Microbiology, Akash Institute of Medical Sciences and Research Centre, Prasanahalli Main Road, Bengaluru Rural, India
Email: sreejasethumadhavan1982@gmail.com

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ABSTRACT

Introduction: Needle stick injury is a major healthcareconcern as it not only transmits infection like HIV, Hepatitis B and C but it also leads to severe emotional distress resulting in loss of working days affecting the health care delivery system. Adequate sensitization resulting in good knowledge,attitude, and practices in healthcare personnels can prevent needle stick injury and also help them to take proper action if the injury occurs so as to prevent further complications. **Aim:** The aim of the study is to assess the status of knowledge, attitudes,and practices as well as the reporting trend among healthcare workers about NSIsso that appropriate sensitization and trainings can be planned out routinely with regular monitoring. **Material and Method:** A standardised structured questionnaire as Google form, was used to collect data from all participants uniformly. This method ensured consistency and reliability in gathering information regarding participants' knowledge(9), attitudes(6), and practices (5) related to needle stick injuries. The data analysis and comparison across different categories of healthcare workers was done by linking the google form to MS excel and further statistical significance of the data was analysed using SPSS v26. **Results:** We received a total of 253 responses in a period of 2 months. Medical interns (35.9%) being the maximum responders followed by Medical PGs (26.1%). Among the knowledge questions; question on Protective titer of anti HBs, Post exposure prophylaxis on Human Immunodeficiency Virus Infection (HIV) and follow up testing of Hepatitis B virus (HBV) infection and Hepatitis C(HCV)had maximum no of incorrect responses resulting in poor performance (<60%). None of the attitude questions had poor responses. Among the practices (76%) and needle destruction practices(50.4%) was followed by many participants which is one of the main factors resulting in needle stick injuries. Of the 253 study participants, 41 had history of NSI of which only 31 (75.6%) had reported the injury and got the source and themselves tested for HIV, HbsAg and HCV.The maximum needle stick injury occurred during a procedure and administration of drug (total of 60.9%). Recapping has resulted in only 5(12.19%) of NSIs in our study. **Conclusion:** Our study was able to get a current status in less time regarding the needle stick injury reporting as well as the knowledge, attitude and practice of health care staff. We could not elicit any statistically significant difference in the above with respect to job category and job experience. The importance of confirming the response to vaccine is very important and anti HBs titer after 3rd dose as a mandatory should be included in the hospital as well national policies. The sensitization classes are important along with it constant reminders in form of posters, google form, questionnaire, regular audits, evaluation tests is required for proper reporting and prevention of needle stick injury and is complications

Keyword: Needle stick injury, HIV,Hepatitis B, Hepatitis C

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INTRODUCTION

Needle stick injuries (NSIs) among healthcare workers (HCWs) poses a global health concern, exposing them to blood-borne pathogens.Needle stick injuries (NSIs) represent a pervasive occupational risk for healthcare workers (HCWs), with the potential for transmission of blood-borne pathogens.The risk of transmission of HBV is highest (30%), followed by HCV (3%) and HIV (0.3%).[1]Most of the NSI are preventable, and obtaining the information regarding the circumstances of the injury is of utmost importance to obtain preventive measures

Needle stick injuries are often under reported, health care institutions should not interpret low reporting rate as low injury rate. The importance of reporting NSI should be emphasised during sensitisation classes as well as hospital infection control rounds and meetings. These injuries have potential health consequences as well as emotional distress in health care workers which results in missed workdays and directly affects the health care services and resources.The risk of transmission of infections such as Hepatitis B, Hepatitis C, and HIV underscores the importance of understanding the knowledge, attitudes, and practices of HCWs regarding NSIs.[2,3]In case of HIV and HCV we do not have any vaccine, so the only way of protection is prevention with good knowledge, attitude and practices of healthcare staff with regard to needle sick injury.[4]

The aim of the study is to assess the status of knowledge, attitudes, and practicesas well as the reporting trend among healthcare workersabout NSIs so that appropriate trainings can be planned out routinely with regular monitoring.

MATERIAL AND METHODS

Source of data: The participants in this studywere healthcare workers: -Doctors including staff, post graduates(PG) and interns , Nurses ,Technician,from Akash Institute of Medical Sciences, Devanahalli, Bangalore.

Method of Collection of data: Standardized Questionnaire

A standardized questionnaire in Google form,was used to collect data from all participants uniformly. This method ensures consistency and reliability in gathering information regarding participants' knowledge, attitudes, and practices related to needle stick injuries. The structured nature of the questionnaire allowed us in systematic data analysis and comparison across different categories of healthcare workers.

Study design: Cross sectional study

Study Period: The data collection period took around 2 months (May 15th, 2024, to July 15th2024) with personal reminder to respond to the google form once a month

Sample Size: We received a total of 253responses

Statistical Analysis: The data directly linked to MS excel from the Google form and appropriate filters applied to analyse the data. SPSS v26 was used for statistical analysis.

The questionnaire comprisesof details of the participants and questions with responses in form of Yes or No. Some questions had multiple choices with single correct response and few questions require descriptive answers. Some questions were for data analysis only and will not be scored.

There are 9,6,5questions (total 20) to assess knowledge, attitude, and practice of NSI respectively. The scoring of the above was done as follows.[5]

Levels	Percentage
Poor	<60%
Moderate	60-80%
Good	>80%

The validity of the questionnaire was done internally and externally by qualified experts

RESULTS

Table I: Sociodemographic characteristics of the studied group.

Variables	N(%)
Gender	
Male	117 (46.2%)
Female	136 (53.7%)
Age	
20-40yrs	233 (92.1%)
40-60yrs	15 (5.9%)
>60yrs	5(1.9%)
Job category	
Doctor- staff	37 (14.6%)
Medical PG	66(26.1%)
Medical intern	91 (35.9%)
Technician	10(3.9%)
Nurses	49 (19.3%)
Job location	

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Emergency	11(4.3%)
OPD	34(13.4%)
Ward	47(18.6%)
Ward OPD	92(36.3%)
ICU	14(5.5%)
Lab	35(13.8)
Others	20(7.9%)
Job duration	
<5yrs	54(21.3%)
5-10yrs	21(8.3%)
>10yrs	21(8.3%)
Student PG/Intern	157(62%)

Table II: Response of studied group regarding knowledge questions

Questions (9)	Correctresponse % (total=253 responses)
1.Diseases transmitted by NSI	98.4
2.Needles are discarded in	93.2
3.What are the benefits of double gloving	90.5
4.To whom do we report needle stick injury?	84.5
5.Protective titre of anti HBs is	54.9
6.What is the PEP for non-responders(after 2 series of 3doses) with respect to Hepatitis B vaccination	76.2
7.PEP for HIV should be taken within 72 hrs	94
8.What is the post exposure prophylaxis for HIV infection for adults	57.7
9.Follow up testing for HBV and HCV is done at	28

Table III: Response of studied group regarding attitude questions

Questions (6)	Correct response % (total=253 responses)
1.Attending training session regarding blood borne pathogen is mandatory for reduction of NSI	90.9
2.Should needle stick injury be reported?	97.2
3.Does double gloving protect against NSI?	81
4.Post Exposure testing for exposed healthcare professional and source patient for hepatitis B, hepatitis C and HIV is essential	95.6
5Contracting Hepatitis B through contaminated needle is higher than the risk of contracting hepatitis C and HIV	88.1
6.Needles should not be shared or damaged in any way	90.5

Table IV: Response of studied group regarding practice questions

Questions (6)	Correct response % (total=253 responses)
1.Do you use needle cutter or syringe destroyer?	50.6
2.Do you recap needles after use?	34
3Do you bend/break needles?	75.8
4.Do you use double gloves	89.3
5 Immediate response to NSI	73.1
6 Have you received training on needle stick injury prevention and biomedical waste segregation	61.2

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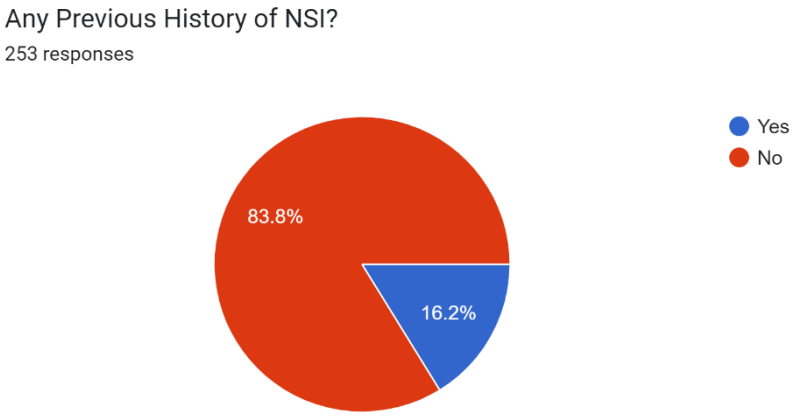

Figure 1: Responses confirming history of NSI

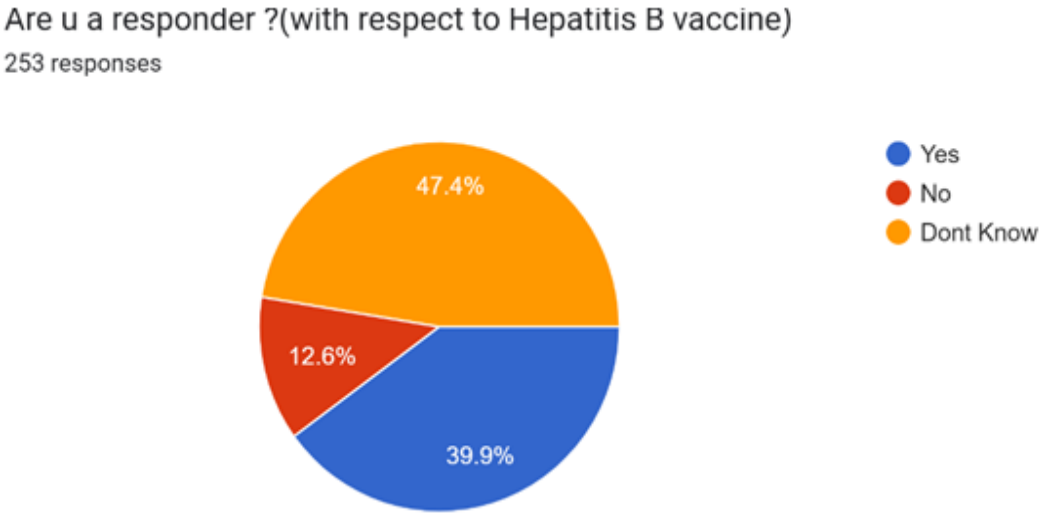

Figure 2

Table V: Association of Job category and Years of Experience with performance (knowledge questions).

	KNOWLEDGE	Good	Moderate	Poor	Fisher exact value	P value
JOB CATEGORY	Doctor-Intern	50	40	1	6.416	0.622
	Doctor-PG	40	26	0		
	Doctor-Staff	24	12	1		
	Nurse	28	21	0		
	Technician	4	6	0		
YEARS OF EXPERIENCE	< 5 years	28	25	1	4.862	0.548
	5-10 years	14	7	0		
	>10 years	17	7	0		
	Student (PG/Intern)	87	66	1		

Table VI: Association of Job category and Years of Experience with performance (attitude questions).

	ATTITUDE	Good	Moderate	Poor	Fisher exact value	P value
JOB CATEGORY	Doctor-Intern	44	27	20	9.922	0.261
	Doctor-PG	34	14	18		
	Doctor-Staff	20	8	9		
	Nurse	22	10	17		
	Technician	4	0	6		
YEARS OF EXPERIENCE	< 5 years	23	11	20	6.375	0.38
	5-10 years	14	2	5		
	>10 years	11	6	7		
	Student (PG/Intern)	76	40	38		

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Table VII: Association of Job category and Years of Experience with performance (practice questions).

	PRACTICE	Good	Moderate	Poor	Chi square value	P value
JOB CATEGORY	Doctor-Intern	31	30	30	15.159	0.056
	Doctor-PG	27	23	16		
	Doctor-Staff	18	8	11		
	Nurse	24	12	13		
	Technician	9	0	1		
YEARS OF EXPERIENCE	< 5 years	26	13	15	9.105	0.166
	5-10 years	14	3	4		
	>10 years	12	5	7		
	Student (PG/Intern)	57	52	45		

Table I shows the study group comprised of 46.2% of males and 53.7% females with studentsthat is medical interns (35.9%) being the maximum responders followed by Medical PGs (26.1%)

Among the knowledge question (Table II), question on Protective titre of anti HBs, PEP on HIV and follow up testing of HBV and HCV had maximum no of incorrect responses resulting in poor level of knowledge (<60%)

None of the attitude question (TableIII) had poor responses, all attitudequestions had positive response from all the participants

Among the practices recapping (Table IV) (76%) and needle destruction practices(50.4%) was followed by many participants which is one of the factors leading to NSIs

Of the above 41(16.2%) (Figure 1) with history of NSI only 31 (75.6%) had reported the injury and got the source and themselves tested for HIV, HbsAg and HCV.

The maximum needle stick injury occurred during a procedure and administration of drug (total of 60.9%). Recapping resulted in 5(12.19%) of NSIs.

Among the needle stick injuries maximum was in Medical -PG (39.02%) and Nurses category(36.55%) category. On comparison of the injury rate among the two categories the nurse's injury rate (30.6%) was more compared to Doctor PG category (24.2%)

The number of needle stick injury forms which were received in last 1 year was just 6 in number.The number of NSI formsreceived 3 months before the study was1 and the number of NSI formsreceived(May 15th, 2024) post 3 months of the study was 9 which is a significant increase.Among the 187(73.9%) (Figure 2) who have been vaccinated only 95 (50.8%) are responders the remaining 75 don't know their status and 17 are non -responders. As shown in Tables V,VI and VII there was no association between job categories and years of experiences with knowledge ,attitude and practices in our study group.

DISCUSSION

We had a NSI rate of 16.2%which and was less compared to Ghufran et all[5]who had a rate of 53.8%and Datar et al [2]with a rate of 25.2% but like the above studies nurses where among the once who were maximum affected with Needle stick injury (36.55%) with injury rate of 30.6%probably due to the heavy workload, lessnurses to patient ratio and frequent shifts.[6]The maximum needle stick injury reported in our study occurred during a procedure and administration of drug (total of 60.9%) and as the nurses are in charge of the administration of drugs which was similar to Afia Zafar et al study[7]Many other studies[5,8,9]have reported recapping as one of the major cause of NSI but in our study it accounted only for 12.19% though 76%of them followed the practice of recapping of the needles before disposal.

There seems to be an increase in the number of NSI forms submitted, 9 post study compared to 1 before the study.Though the number is very small to run an analysis but there is a definite increase in the number of reporting of NSI. Regular sensitization and monitoring with posttests and google forms is the best way to get an increase in Knowledge ,Attitude and Practices of health care staff, reporting of needle stick injury as well as reducing the NSI and its complication.

Even in the NSI reported cases 6 months follow up is required which becomes very difficult.In cases where the source is positive, we try and remind the exposed person personally by phone for follow up testing and next dose of vaccine.

The number of vaccinated individuals in our study was 187(73.9%) which was higher compared to other studies from India.[10,11]The non-responders in vaccinated individuals (49.2 %) is an alarming number and we should make it a mandate that after 1 month of third and last dose of the vaccine an anti HBs titershould be done and documented . All non -responders should be given a second series of vaccination which is not routinely done. Hopefully with our study we can enforce the management to make it a mandate for all health care professionals. Routine checkup for anti HBs titer and booster doses are not recommended as fall in anti Hbs titer is expected.[1,12,13]but at least a documentation that after vaccination the person had obtained a protective titer of>10 IU is very important as in our study 40% of them had done their anti HBs titre and therefore not aware of their status. To know whether you're a responder or not is important as it will determine the course of action if the healthcare staff gets a needle

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stick injury. One limitation in our study is that we did not do a personal interview with the study participants, therefore we are not very confident they understood the term responders as many of them were not aware of the protective titer of anti HBsAg which was a question in knowledge domain and percentage of correct responses was low.

We have been taking regular sensitization classes for the staff with pre and posttest but despite that only 61.25% remembered attending the classes the remaining 11.06% do not remember and 27.6% have not attended the classes.

CONCLUSION

Our study was able to get a current status in less time regarding the needle stick injury reporting as well as the knowledge, attitude and practice of health care staff. We could not elicit any statistically significant difference in the above with respect to job category and job experience. The importance of confirming the response to vaccine is very important and anti HBs titre after 3rd dose as a mandatory should be included in the hospital as well national policies. The sensitization classes are important along with it constant reminders in form of posters, google form, questionnaire, regular audits, evaluation tests is required for proper reporting and prevention of needle stick injury and is complications

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