



Assessment of Knowledge and Existing Practices of Staff Nurses Regarding Needle Stick Injuries – A Descriptive and Correlation Study

Authors

Mrs. Sanghamitra Dasgupta¹, Dr Anjan Dasgupta^{2*}

¹M Sc Nursing, Senior Sister Tutor, RGKAR Medical College, Kolkata, WB

Email: sanghamitra.dasgupta7@gmail.com

²Associate Professor, G & O, Midnapore Medical College, WB

*Corresponding Author

Dr Anjan Dasgupta

Email: dasguptadranjan08@gmail.com

Abstract

Needle stick injuries (NSI) are the wounds caused by needles that accidentally puncture the skin and transmit approximately twenty pathogens especially blood-borne viruses. It enters within the body through a small innocent pore may injure the body with deadly blood borne pathogens like HBV (Hepatitis B Virus), HCV (Hepatitis C Virus) and HIV (Human immunodeficiency Virus). Center for Disease Control and Prevention (CDC, 2004) estimates that each year approximately 3, 85,000 needle stick injuries and other sharp injuries are sustained by hospital based health care personnell. In USA the number of needle stick injuries is estimated to be one million per year². Unreported needle stick and sharp injuries are serious problem. About 40 -70 % of all needle stick injuries are unreported³ due to lack of knowledge. Only 10 % knew how to report in spite of a comprehensive training and education programme (Trim et al, 2003)⁴. The health care workers, particularly the staff nurses frequently get needle stick injuries in different ways during giving care to the patient, but neglect the injuries most of the time. Therefore, nurses should have knowledge regarding the importance of prevention and management of needle stick injuries. In order to stay healthy they should protect themselves not only from the known infected cases but also from all patients whose viral status is not known.

Objective: To estimate the knowledge of staff nurses regarding prevention and management of needle stick injuries.

To identify the existing practices of staff nurses regarding needle stick injuries.

To relate the knowledge and practices of staff nurses regarding needle stick injuries.

Study Design: A Descriptive survey included 100 staff nurses to identify knowledge and existing practices regarding prevention and management of needle stick injuries. The conceptual framework of study was based on Health Belief Model and the research approach adopted was Descriptive Correlation survey approach. Convenient sampling technique was used to select 100 professionally qualified (GNM Gr. II) staff nurses of a District Hospital in West Bengal. A structured knowledge questionnaire and an observation check list were used to collect data after establishing reliability and validity.

Result: The study findings revealed that there is significant relationship between knowledge and practices of staff nurses ($r= 0.7, t= 11.12, p< 0.05$). Chi –square test also showed significant association between knowledge and practice scores and incidence of NSI ($p <0.05$).

Conclusion: Knowledge among staff nurses regarding risks and hazards associated with NSI and its management is inadequate. Existing practices among them are also not adequate for safe practicing and implementation of universal precaution in wards. Regular training of the nursing staff regarding prevention and management of NSI can ensure awareness and safety. Besides the availability of sufficient syringe-needles, needle-cutter and other protective devices, good infection control technique is very essential to avoid injury and there by occurrence of dreadful blood borne diseases.

Keywords: Needle sticks injury (NSI).

Introduction

Needle stick injuries (NSI) are wounds caused by needles that accidentally puncture the skin, are truly an occupational hazard for medical personnel who work with hypodermic and other types of needles¹ and could transmit many pathogens including bacteria and deadly blood borne viruses like HBV(Hepatitis B Virus), HCV (Hepatitis C Virus) and HIV(Human Immune deficiency Virus). NSI increasing day by day and globally approximately 2 million health care workers suffer from infection per year through this route². Most reported NSI involve nursing staffs who remain at risk of occupational acquisition of blood borne infection (CDC, 2000)³ of which Hepatitis B,C and HIV are most common⁴ though most of them are unaware of this serious problem⁵. So knowledge and practice of staff nurses about the prevention and management of exposure to NSI should be given high priority. Preventing NSI is the most effective way to protect workers from infectious diseases that needle stick accidents transmit. The focus of the study is twofold: first to assess the cause and prevalence of exposure due to NSI to nurses and second, to assess the knowledge and existing practices of staff nurses for preventing themselves from the hazard of NSI.

Objectives

1. To estimate the knowledge of staff nurses regarding prevention and management of needle stick injuries.
2. To identify the existing practices of staff nurses regarding needle stick injuries.
3. To relate the knowledge and practices of staff nurses regarding needle stick injuries.

Materials and Methods

After ethical approval, the present study was conducted at a district hospital of West Bengal which is a type of descriptive and correlation survey design to assess the knowledge and practice level among the staff nurses and to find out the relationship between this two variables

Selection criteria

1. Qualified staff nurses with GNM diploma.
2. Staff nurses willing to participate in the study.
3. Staff nurses involved in the bed side nursing.
4. Staff nurses available within the study period.

Exclusion criteria

Staff nurses not willing to participate.

Sample size

100 samples (N=100) were selected for the study. Sample size calculation based on by assuming the prevalence of NSI as 61.4% from a previous study conducted with 10% absolute error⁶. By applying the formula $N = z^2_a PQ/L^2$, assuming 10% non response rate, the size of the sample comes to be 100.

Data collection tools and technique

According to the objectives and conceptual frame work of this study, the following data collection tools were developed to collect the data:

- 1) A structured knowledge questionnaire to assess the knowledge of the staff nurses regarding needle stick injury.
- 2) An observational checklist to observe the existing practices of staff nurses.

Planning the structured knowledge questionnaire

In planning the structured knowledge questionnaire, the purpose, general objectives and specific objectives and specific content area were outlined. A blueprint was prepared on the items and the content area was classified into different areas as definition, causes, factors influencing injury, type of injury, risks of injury, preventive measures, management regarding needle stick injuries. Few questions were found to be very easy and few were found very difficult. They were however retained as the questions were found to be very important and link questions of the content. Based on the blueprint, twenty eight multiple choice items were prepared for assessing the knowledge of nursing personnel regarding prevention and management of needle stick injury.

A score of one was given for every correct answer and zero for every incorrect answer.

Development of observation checklist

An observation checklist was prepared by the researcher to assess the practices of staff nurses regarding handling of needles. Review of literature and the experience were the basis for the construction of the checklist. The observation checklist consisted of fourteen nursing activities. If the nursing activities were performed, one score was given and zero score was given, if the activity not performed. Thus the total score was fourteen.

Plan for data analysis

After collection of data, a master chart was prepared. The data analysis was planned so as to use both descriptive and inferential statistics.

1. Frequency and percentage distribution to describe-----

Sample characteristics.

Incidence of needle sticks injury.

2. Computation of Mean, Median, S.D and Area wise Mean percentages of---

Knowledge score of nursing personnel regarding prevention and management needle stick injury.

Practice scores of nursing personnel regarding prevention and management needle stick injury.

3. Computation correlation coefficient (Pearson product moment) would be done between

knowledge and practice scores and 't' value would be calculated to find out the significance of relation at 0.05 level.

4. Computation of 't' value (Independent "t" test) would be done to find out significance of difference between-----

The knowledge scores of staff nurses having injury & no injury .

The practice scores of staff nurses having injury & no injury.

5. Chi square value (test of significance) would be computed to find the association between-----

Knowledge & practice scores of nursing personnel with the incidence of needle stick injury.

Results and Analysis

All the staff nurses are professionally qualified as GNM. 37 % of nursing personnel were among 31-40yrs of age group and 16% of staff was within 30 yrs. of age group. The data also showed that 38% of staff nurses had professional experience of 11 to 20yrs and only 4% had more than 30yrs. of experience. Majority (92%) had undergone in-service training programmed regarding prevention and management of HIV and AIDS. Among the hundred respondents, only 29 percent staffs had taken vaccine against Hepatitis B virus, among which only 41% staffs had completed schedule dose of Vaccine till date.

Diagram 1 Ward wise incidence of needle stick injury among the nursing personnel (N = 62)

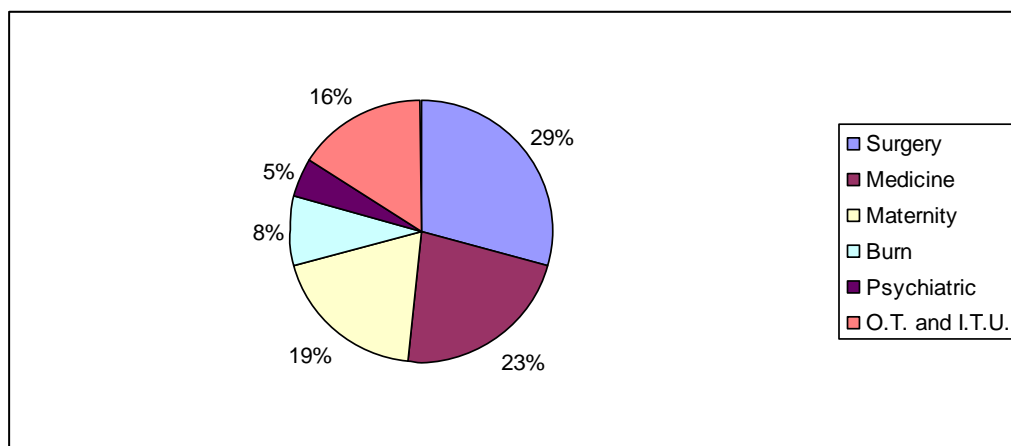


Figure showed distribution of Staff experienced injury according to ward or Unit. Maximum respondents (29%) were from Surgery Ward.

Diagram 2 Percentage distribution of the type needle which caused most needle stick injury (N=62)

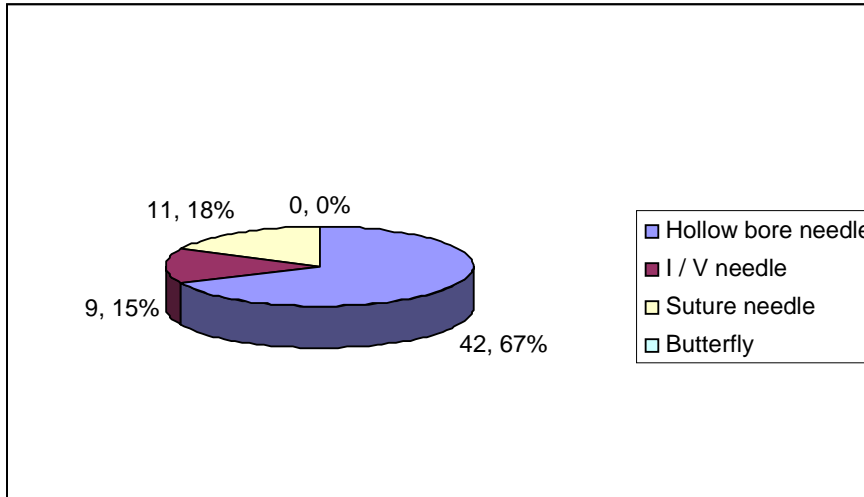
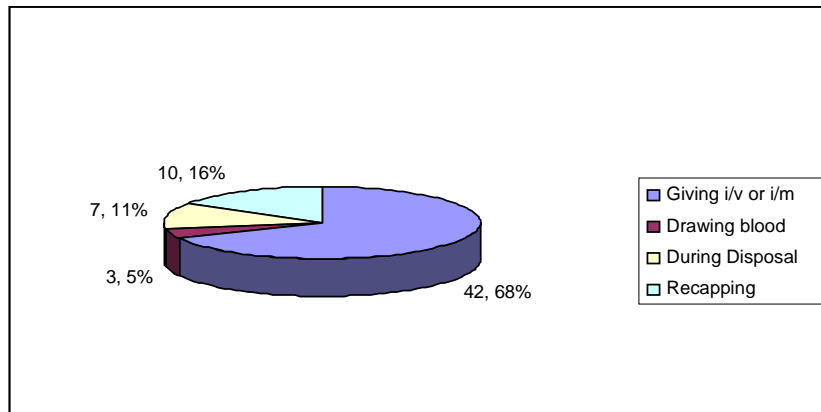


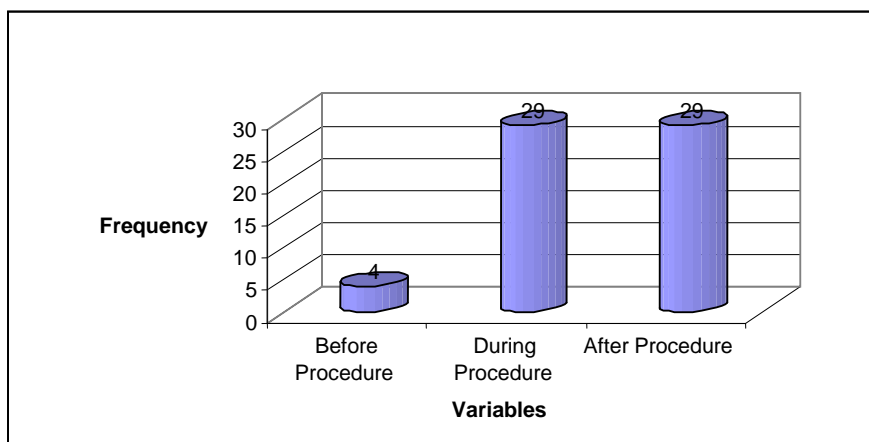
Figure showed that majority of subject (67%) sustained needle stick injury with hollow bore needle.

Diagram 3 Distribution of the nature of work during occurrence of needle sticks injury among subjects. (N=62).



The data presented in figure revealed that the maximum number of occurrence needle stick injury (68 %) among staff nurses were during giving i/v or i/m injection to the patient.

Diagram 4 Figure showing the time of occurrence of needle stick injury among staff nurses (N=62)



Data showed that the maximum no (46.7%) of needle stick injury occurred during and after the completion of the procedure by the staff nurses.

Diagram 5 Time gap between injury and reporting (N=16).

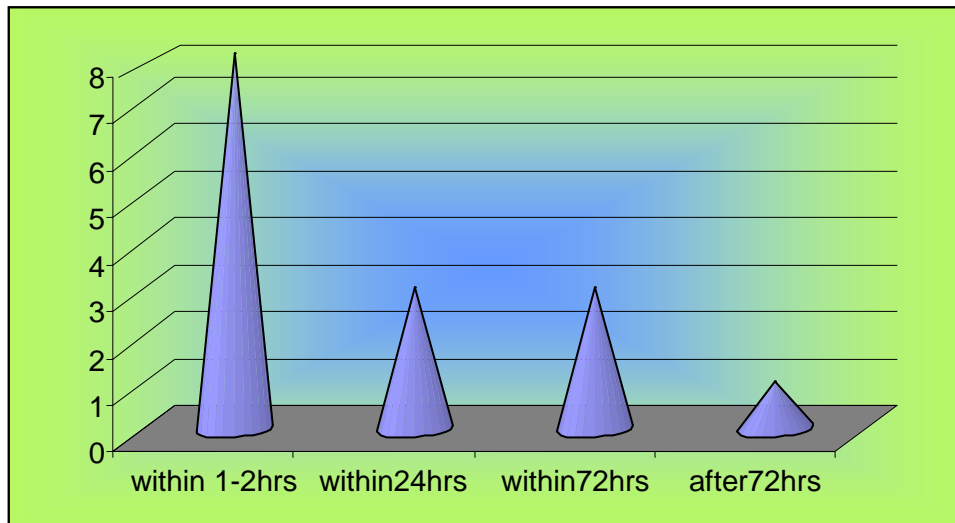


Figure revealed that majority of the respondents (50%) reported within 1-2hrs of injury, only one respondent reported after 72hrs.

Diagram 6 The major reasons for not reporting (N=46)

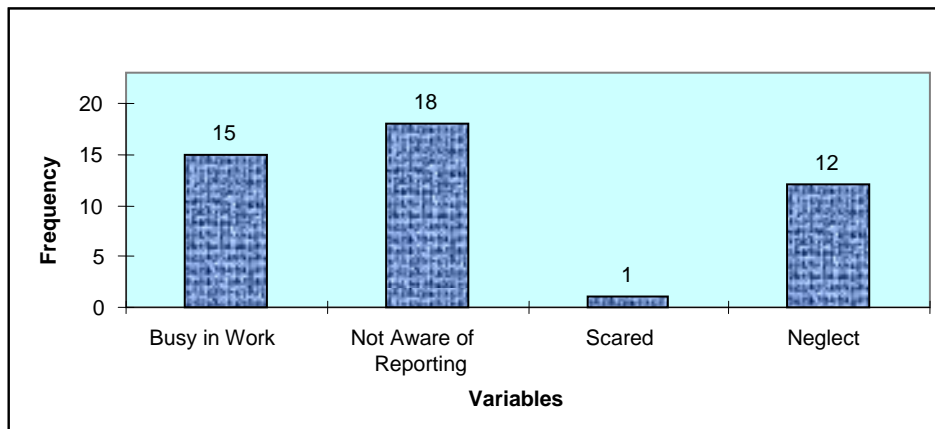


Figure showed the major reasons for not reporting injury followed by the reason of busy in work was lack of awareness for reporting (39 %) after (32%).

Table.1: Mean, Median, Standard Deviation, Mean Percentage of Knowledge Score (Maximum possible score-28) of Nursing Personnel Regarding Needle Stick Injury (N=100)

Area	Range	Mean	Median	S.D.	Mean %
Knowledge	8 - 22	14.21	14	3.06	50.75

Data in the table indicated mean as 14.21 and median as 14; that is, mean and median are almost same. SD of 3.06 indicates that scores are moderately dispersed.

Mean percentages of knowledge score of staff nurses were 50.75 %, which indicating low level of knowledge of staff nurses regarding prevention and management of needle stick injuries.

Table no.2: Mean, median, standard deviation and mean% of practice scores (Max possible score-14) of nursing personnel regarding needle stick injury (N=100).

Area	Range	Mean	Median	S.D	Mean%
Practice	5-11	7.39	7	1.251	52.78

Mean & median of the practice score fall close together indicate homogeneity of the group. The

mean percentage of practice score is 52.78 which is remarkably low for professional personnel.

Table no.3: Relationship between knowledge and practice scores of nursing personnel regarding needle stick injury

N= 100areas	Correlation co-efficient	t value	Significance at 0.05level
Knowledge & Practice	0.7052	11.12 *	S
*t = 1.98, df =98, p<0.05		S-Significant	

The coefficient of correlation between knowledge scores and practice scores was found to be r 98 = 0.70 which was statistically significant at 0.05 level. Therefore, the null hypothesis is rejected and research hypothesis is accepted at the 0.05

level and it can be said that a significant positive relationship exists between them. So, it can be concluded that those who had a low knowledge score, also had a low practice score and vice versa.

Table no-4: Chi-Square value showing the association of Knowledge & Practice of Nursing Personnel regarding incidence of Needle Stick Injury. N=100

Sl.No.	Variables	Chi-Square value	df	significance
1.	Knowledge level And occurrence Of injury	33.126*	1	significant p <0.01
2.	Practice level And occurrence Of injury	4.702*	1	significant p<0.05

Table showed that computed value between knowledge scores & incidences of needle stick injury was found statistically significant at 0.01 level. Again the table showed that that computed value between practice scores & incidence of needle stick injury found statistically significant

0.05 levels. This indicated that there is significant association between incidence of needle stick injury with knowledge & practice of staff nurses regarding prevention and management of needle stick injury

Table no-5: Mean, median, standard deviation of knowledge score of the nursing personnel who has experienced injury and who has no injury (N=100).

Needle stick injury	Mean	Mean difference	SD	t value	Significance At 0.05 level
YES	13.51	1.78	2.797	2.539*	s
NO	15.29		3.993		
*t =1.98, df=98		p<0.05		s –significant.	

Mean knowledge scores of subjects (15.29) without injury was apparently higher than the mean knowledge scores of subjects (13.51) with injury, by a mean difference of 1.78 which indicated knowledge difference between the subjects. The obtained mean difference is statistically significant (as evident from ‘t’ value

of 2.54 which is greater than the table value of 1.98 at 0.05 level of significance) indicating that the difference is true. Thus we can conclude that there is a significant association between incidence of injury and knowledge of staff nurses regarding needle stick injury

Table no- 6: Mean median, standard deviation of practice score of the nursing personnel who has experienced injury and who has no injury.

Needle stick injury	Mean	Mean Difference	SD	t value	Significance At 0.05 level
YES	6.93	1.01	1.401	0.362	ns
NO	7.94		1.334		

.t =1.98, df=98 ns- non-significant

Mean practice scores of subjects (7.94) who had no injury was apparently higher than the mean knowledge scores of subjects (6.93) who had injury with a mean difference of 1.01 which indicating low practice difference between the subjects. The obtained mean difference was not found to be statistically significant as evident from 't' value of 0.362 which was lesser than the table value of 1.98 at 0.05 level of significance. Thus we can conclude that the observed difference of mean is by chance there is no significant association between incidence of injury and existing practices of staff nurses regarding needle stick injury.

Discussion

In the present study, the incidence rate of needle stick injury is 62 percent which is consistent with the findings of Joarder GK, Chatterjee C et.al⁶ who reported 61.4 percent needle stick injuries among nurses in hospitals of West Bengal. Simon L Patrick⁷ reported 70 percent incidence in a hospital of Delhi. The incidence of injuries in this study was considerably higher than studies which were done in other countries, i.e., in Iran (13.9%)⁸, Turkey (48%)⁹ but lower than the incidence in China (87%)¹⁰.

In our study majority of staff nurses (68%) sustained needle stick injury while giving injection Similarly, Ebrahimi H, Khosravia A¹¹ reported of injury in 44.8 percent cases while giving intramuscular and subcutaneous injections which was in contrast with the findings of Nagao Y, Baba H et al (Japan)¹² in which majority of cases (55.9%) injuries occurred during disposal of used needle.

The present study showed that maximum number of injury (42%) occurred with hollow bore needle

which is supported by the study report of Ebrahimi H, Khosravia A¹¹.

In present study, most of the injury occurred during & after completion of a procedure and before disposal (32%), which is consistent with the study done in Iran, in which the majority (51.8%) of injuries occurred after use and before disposal of the needle.

This study revealed that majority of the injury occurred during evening shift(46%) followed by night shift (33%) which is contrastingly opposite with the study report of Ebrahimi H, Khosravia A¹¹, in which almost two-thirds of the cases, the accidents occurred in morning (31.6%) or two continuous shift work that followed each other (31.6%).

There was lack of awareness among staff nurses regarding prevention and management of needle stick injury.

The present study revealed that majority of staff nurses (72%) did not report the needle stick injury, which is similar with the study report of Simon Patrick (Delhi)⁷, in which non-reporting cases was 71 percent. Another important issue of this study was awareness regarding post exposure prophylaxis (PEP) which was found very low (19%). Majority (70%) of staff nurse were not aware about the importance of PEP. Similarly, Siddiqui k, Mirja S¹³ reported very low awareness (10%) of the staff nurses about PEP.

Among 16 respondents (who reported about injury), majority (69%) reported to M.O In-charge of PEP (V.C.T.C) and 31% respondents reported to M.O of the unit. But no respondent reported to ward sister. On further questioning they said that they had no clear idea about whom to report.

Majority of the respondent (50%) reported about injury within 1-2 hours of the incident, only one respondent reported after 72 hrs.

72% of the respondent had washed hand with soap and water.

In 80% of cases patient's blood report was unknown, as they had not undergone any blood test regarding HBV, HCV & HIV. Blood test for HIV was done only for 17 percent of the respondents and blood test for HBV done for only one respondent as the patient has previous history of infection with HBV. 61% of respondents did not have knowledge about the M.O In-charge, who was responsible for post exposure prophylaxis (PEP).

72% of the subjects had not aware about the counseling facilities present in their hospital after any occupational exposure. 70% of the subjects did not aware about the availability of PEP in the hospital for 24hours for emergency situation. On further question they said that they did not know the place where the medicines of PEP were kept for emergency.

Mean percentage of knowledge score for staff nurses was 50.75% and maximum deficit of knowledge(28%) was found in the management area. Mean percentage of practice scores of staff nurses was 52.78% and maximum deficit in practice found in the preventive aspects (20%) maintained by the nursing personnel.

The coefficient of correlation between knowledge scores and practice scores was found 0.70 and was statistically significant at 0.05 level. Therefore, it can be said that a positive relationship exists between them. Therefore, it indicated that who had a low knowledge scores, also had a low practice scores and vice-versa. An important aspect in this study is that, the awareness related to safe medical practices regarding needle NSI was found very low(mean percentages-50.75%). The universal precautions was not followed properly by maximum number of staffs in contrast to a study report by Z Afar Afia, Aslam Naveen et al (2007)¹⁴ done on medical personnel

and found that practices of nurses were generally safer than doctors .

The computed chi-square values between knowledge and practice scores of subjects and incidence of needle stick injury was found significant. Mean knowledge scores of subjects (15.29) who had no injury was higher than the mean knowledge scores of subjects (13.51) who had injury with a mean difference of 1.78 indicating knowledge difference between the subjects. The obtained mean difference was statistically significant and true, indicating association between knowledge and incidence of injury.

Mean practice scores of subjects (7.94) who had no injury was higher than the mean practice scores of subjects (6.93) who had injury with a mean difference of 1.01 which indicate low practice difference between the subjects. The obtained mean difference was not found statistically significant and the difference was by chance, indicating low association between practice and incidence of injury

Conclusion

This study reveals that-

Knowledge among staff nurses regarding risks and hazards associated with needle stick injury is inadequate. Knowledge level about the management of needle stick injury is very deficient.

Existing practices among staff nurses are not adequate for safe practicing and the implementation of universal precaution in wards. Practice score level in the area of preventive measures is very low.

Regular training of the nursing staff regarding prevention and management of NSI can ensure awareness and safety.

Besides this the availability of sufficient syringe-needles, needle-cutter, protective devices and newly improved syringes are necessary for prevention of this incidence.

Finally it can be said that good infection control technique is very essential to avoid injury and

there by occurrence of dreadful blood borne diseases.

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