

*Research article***Knowledge among nursing students of blood borne viruses and practices to prevent transmission**Arunima Sharma<sup>1</sup>, Ashima Sharma<sup>2</sup>, Ashok Sharma<sup>2</sup>*Sri Lankan Journal of Infectious Diseases 2017 Vol.7 (2):100-105*DOI: <http://dx.doi.org/10.4038/sljid.v7i2.8151>**Abstract:**

**Objectives:** The main objectives of this study were to determine the knowledge about blood borne viruses and practices to prevent its transmission among nursing students of a teaching hospital in North East India

**Methodology:** A cross sectional study was conducted in a nursing college in North East India among the nursing students involved in clinical practice. The study duration was of two months. Sample size of 200 for the study was arrived at by applying the formula  $4pq/l^2 + (4pq/N)$  where  $(4pq/N)$  is the finite population correction factor where N is equal to 357 which is the total estimated population and l is the allowable error which is taken as 10%. Statistical analysis was carried out by using software SPSS version 20 and frequency, proportions and percentages were calculated. A pre-tested questionnaire regarding the knowledge, and practices related to blood borne infections was used.

**Results:** Majority of the students (62.5%) had knowledge about the three most serious blood borne infections though only 25% were aware that HIV is transmitted by infected blood, unprotected sexual intercourse, tattooing and piercing instruments, mother to child during pregnancy and during labour. This study also showed that the majority of the students (89%) knew that being a healthcare worker puts them at risk of acquiring Hepatitis B, C and HIV.

**Conclusions:** The present study concludes that the nursing students of Sikkim Manipal Institute of Medical Sciences have a fair knowledge of the cause of blood borne infections. Awareness and practices regarding use of personal protective equipment was also good. However, the nursing education programme should prepare nurses for providing effective and efficient nursing care for patients and use adequate protective measures to minimize risk of occupational hazards to themselves.

*Keywords: Blood borne infection, Attitudes, Occupational exposure, North East India.*

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## Introduction

Exposure to blood-borne pathogens poses a serious risk to healthcare workers (HCWs). Transmission of at least 20 different pathogens by needle prick and sharp injuries have been reported.<sup>1</sup> Despite improved methods of preventing exposure, occupational exposure continues to occur. Several studies reported the risks of occupational Blood-Borne Virus (BBV) infection for health care workers (HCWs).

The greatest weapon in reducing infection risk is knowledge about the contributing factors to this risk, strategies for reducing risk and obtaining post-exposure prophylaxis (PEP) when an exposure occurs. Upon reporting an exposure, the HCW should be evaluated and counselled regarding the risk of blood-borne pathogen infection, the potential usefulness of PEP for Human Immunodeficiency Virus (HIV) and/or Hepatitis B Virus (HBV) infections, the need for follow-up evaluation, and precautions to prevent possible transmission of blood-borne viruses to others during the follow-up period.<sup>2</sup> As student HCWs become more involved in patient contact during their training, they are at higher risk of exposure to blood-borne pathogens. The prevalence of Hepatitis B in India is 2.4% for non-tribal populations and 15.9% for the tribal population.<sup>3</sup> The prevalence of Hepatitis C in India has been found to range from 0.7% to 1.8%<sup>4</sup> and the overall prevalence of HIV in India has been documented to be 0.35%.<sup>5</sup> It is a well-accepted fact that the prevalence of these infections is much higher in certain high-risk groups like intravenous drug users and sex workers, and healthcare workers must take special precautions while dealing with such patients. Although a highly infectious disease, a safe and effective vaccine is available for Hepatitis B since 1981. It is the first vaccine against a major human cancer. Awareness regarding Hepatitis B transmission and prevention has been found to be poor among HCW.<sup>6,7</sup>

Very few studies have been conducted to assess the knowledge of nursing students regarding blood-borne infections. This study aims to study the knowledge about blood borne viruses and practices to prevent its transmission among nursing students of a teaching hospital in North East India

## Methodology

A cross sectional study was conducted in a nursing college in North East India among the nursing students involved in clinical practice i.e. Department of Medicine, Surgery, Paediatrics, Obstetrics & Gynaecology and the related branches. The study duration was of two months.

The sample size was calculated using the formula  $4pq/l^2 + (4pq/N)$  where  $(4pq/N)$  is the finite population correction factor and N is equal to 357 which is the total estimated population and l is the allowable error which is taken as 10%. Sample size for the study was 200.

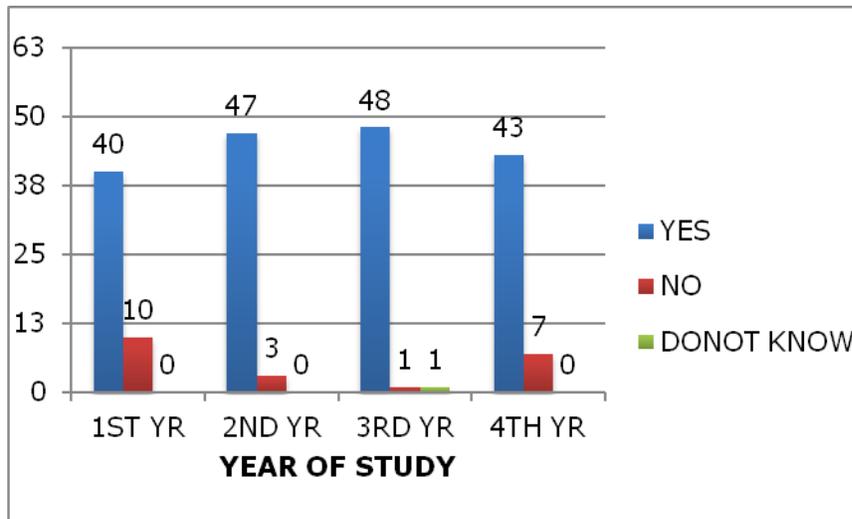
A pre-tested questionnaire regarding the knowledge, and practices related to blood borne infections was used.

Data so collected was entered in a Microsoft Excel spreadsheet and subjected to statistical analysis using software SPSS version 20. Frequency, proportions and percentages were calculated.

## Results

All the nursing students were females of age group 20-25 years.

As shown in Figure 1, 178 (89%) students knew that being a healthcare worker puts them at a risk of acquiring Hepatitis B, C and HIV. The knowledge levels of the students were irrespective



of the year of study of students. During this study it was observed that almost all students had knowledge on the use of gloves while handling medical and biological waste and during procedures with the patients. However, only 84.5% students knew of the use of the needle destroyer and hub cutter after needle usage.

### Knowledge about blood-borne viruses

Of the 200 students enrolled in the study, 125 (62.5%) had knowledge about the three most serious blood-borne infections i.e, HIV, HBV and HCV (Hepatitis C Virus). However, 151 (75.5%) students knew that these three infections are of viral origin (Table I). Fifty eight (29%)

Table I: Distribution of the participants according to the knowledge about blood-borne infections

Students having knowledge	No. of students	
	N	%
only about HIV	7	3.5%
only about HBV	1	0.5
only about HIV, HBV and HCV	125	62.5
that these HIV, HBV, HCV are of viral origin	151	75.5
of HBV & HCV causing liver cancer	22	11

students thought that of the important blood-borne infections (HIV, HBV, HCV, syphilis, malaria), only malaria is curable. 60 (30%) students knew that HBV causes liver cancer while only 22 (11%) knew that along with HBV, HCV also causes liver cancer. Although 101 (50.5%) students knew that HBV is preventable by vaccination, this knowledge

was found to be less among first year students as compared to the rest.

Only 50 (25%) students were aware that HIV is transmitted by infected blood as well as several other routes. Forty nine (24.5%) students believed that along with the above routes HIV can also spread from mother to child by breastfeeding.

### Knowledge about practices to prevent its transmission

Out of the total, 64% (128) students knew that sharp/needles are discarded in the designated blue colour bags. Most of the students were from the second year. All the students knew that blood soaked cotton, dressings etc. are discarded in yellow colour bags. The students knew about universal safety precautions and the majority (104:52%) safeguard themselves against blood-borne infections during patient care by using personal protective equipment (gloves, masks, eye protection and gowns), avoiding needle prick and other sharp injuries and being vaccinated against Hepatitis B.

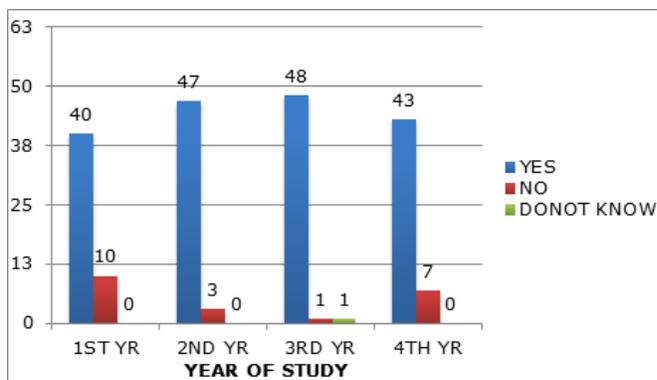


Figure 2: Hepatitis B vaccination status of nursing students

The majority of the students (92.5%) had the correct knowledge that there are three doses of Hepatitis B vaccine. Also an increasing trend of vaccination against Hepatitis B was observed among the nursing students, with 88% of final year students getting immunized as compared to 70% amongst the first year students (Figure 2). Students who were not vaccinated were asked for reasons for not getting vaccinated. The majority (61%) stated that they were afraid of needles, 9% stated they were never advised to be vaccinated while 21% were

not aware of the need for vaccination. The remaining 9% said that vaccination is not necessary for them.

Almost all the students had the knowledge about post exposure prophylaxis (PEP) and 78.5% knew about hepatitis B immunoglobulin (HBIG)

### Discussion

In the present study, it was found that the majority of students had knowledge that the three most serious blood borne infections are HIV, HBV and HCV which are caused by viruses. The study also showed that 89% students were aware that their profession puts them at a high risk of acquiring Hepatitis B, C and HIV. At the same time only 39% were aware that their exposure to blood and other body fluids, and an accidental needle prick injury are the most likely occupational risk factors of blood borne infections. These findings again underscore the importance of training programmes for nursing students regarding occupational exposure.

Almost all the students were aware of the use of safety devices while handling medical and

biological waste and during procedures with patients. Our findings are similar to a study done in Chandigarh among the nursing students of the Government Multi Specialty Hospital, Chandigarh on the knowledge, attitude and practice regarding universal precautions.<sup>8</sup>

This study showed that 98% of nursing students knew that the ideal method to dispose sharps waste was to put it in an approved sharps container after use. This high percentage of awareness of the correct sharps disposal procedure may be associated with the continuing nursing education programmes conducted on a regular basis by the University. These findings are not in accordance with a study done in Poland to assess the knowledge of nurses regarding post exposure prophylaxis (PEP) of blood borne infections at the workplace.<sup>9</sup>

All participants in our study were of the opinion that it is necessary to be aware of the standard precautions in order to prevent acquiring infections from blood or body fluids of patients, and most of them were willing to take part in training aimed at imparting knowledge of standard precautions to those who were not aware of such best practices. Previous studies have shown increased awareness about standard precautions after a training programme.<sup>10</sup> Abdela and coworkers (2016) assessed knowledge, attitudes and practices toward prevention of Hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia.<sup>11</sup> They found that trainees in the health profession are at a very high risk of contracting HBV infection during their training owing to the low HBV vaccine uptake rate and high rate of accidental exposure to blood. After this study they recommended that all students in the health profession should be vaccinated prior to their entry into professional practice.

Paudel and co-workers<sup>12</sup> from Nepal reported that there was a statistically significant difference in the preventive practice of Hepatitis B among different age groups and good preventive practice has been significantly increased according to the academic grades (27.6% in the first year vs. 38.4% in the third year). On the other hand, Reang and coworkers<sup>13</sup> found that in spite of having good knowledge, their practices for prevention of Hepatitis B was not satisfactory. These authors recommend that regular training and awareness seminars about Hepatitis B need to be carried out. A study conducted among medical students in Gujrat, India, showed poor knowledge and practices for Hepatitis B prevention among 1<sup>st</sup> and 2<sup>nd</sup> year students compared with 3<sup>rd</sup> year students.<sup>14</sup> Thus lack of awareness and knowledge regarding occupational hazards among students provides an opportunity to improve basic education and training environments.<sup>15</sup>

## **Conclusion**

The present study shows that nursing students of Sikkim Manipal Institute of Medical Sciences have reasonable knowledge of the cause of blood-borne infections. However, very few participants knew that along with HBV, HCV also has a carcinogenic potential for liver cancer. Awareness and practices regarding the personal protective equipment was good.

The findings of this study have implications for nursing services, education, administration and research. The nursing education programme should prepare nurses for providing effective and efficient nursing care for patients as well as for reducing the risk of occupational hazards to themselves.

## References

1. Collins CH, Kennedy DA. Microbiological hazards of occupational needle stick and 'sharps' injuries. *J Appl Bacteriol.* 1987; 62:385–402 *No doi*
2. Centers for Disease Control. Public Health Service statement on management of occupational exposure to human immunodeficiency virus, including considerations regarding zidovudine post exposure use. *Morbidity and Mortality Weekly Report.* 1990; 39 (RR01):1–14 *No doi*
3. Batham A, Narula D, Toteja T, et al.. Systematic review and meta-analysis of prevalence of Hepatitis B in India. *Indian Pediatr.* 2007; 44(9):663-74. *PMID: 17921555*
4. Acharya SK, Madan K, Dattagupta S, Panda SK .Viral hepatitis in India. *Natl Med J India.* 2006; 19(4):203-17. *PMID: 17100109*
5. National Aids Control Organization, Government of India, Annual Report 2013-2014
6. Sukruti, Pati NT, Sethi A et al. Low level of awareness, vaccine coverage and the need for boosters among health care workers in tertiary care hospitals in India. *J Gastroentero Hepatol* 2008; 23(11):1710-15. *doi : <http://dx.doi.org/10.1111/j.1440-1746.2008.05483.x>*
7. Acharya AS, Khandekar J, Sharma A, et al.. Awareness and practices of standard precautions for infection control among nurses in a tertiary care hospital. *Nurs J India.* 2013; 104(6):275-9. *PMID: 24974532*
8. Kaur R, Kaur B, Walia I. Knowledge, attitude and practice regarding universal precautions among nursing students. *Nursing and Midwifery Research Journal*, 2008; 4(4):115-127. *No doi*
9. Biski B, Wysocki J. The level of knowledge of post–exposure prophylaxis of blood borne infections at the workplace observed in nurses. *Journal of Medical Practices* 2005; 56(3):375-8. *PMID: 16483008*
10. Diekema DJ, Schuldt SS, Albanese MA, Doebbeling BN. Universal precautions training of preclinical students: impact on knowledge, attitudes, and compliance. *Journal of Preventive Medicine* 1995; 24(6):580-5. *doi : <http://dx.doi.org/10.1006/pmed.1995.1092>*
11. Abdela, A., Woldu, B., Haile, K., et al., Assessment of knowledge, attitudes and practices toward prevention of hepatitis B virus infection among students of medicine and health sciences in Northwest Ethiopia. *BMC Res Notes* 2016; 9:410. *doi : <http://dx.doi.org/10.1186/s13104-016-2216-y>*
12. Paudel DP, Prajapati PK, Paneru DP. Preventive practices against Hepatitis B. A cross-sectional study among nursing students of Kathmandu, Nepal. *J Sci Soc.* 2012; 39(3):109-13. *doi : 10.4103/0974-5009.105911*
13. T. Reang, T. Chakraborty, M. Sarker, A. Tripura, A study of knowledge and practice regarding Hepatitis B among nursing students attending tertiary care hospitals in Agartala city-India. *International Journal of Research in Medical Sciences.* 2015; 3(7):1641-1649 *doi : <http://dx.doi.org/10.18203/2320-6012.ijrms20150244>*
14. Singh A, Jain S. Prevention of Hepatitis B - knowledge and practices among medical students. *Indian Medical Gazette* February 2012; 52-56. *No doi*
15. Lutgart, B., Mathieu, V., Heidi, J.C., et al., Awareness, knowledge, and practices regarding occupational hazards among medical students: A longitudinal study before and after admission as trainees. *Journal of Occupational & Environmental Medicine* : 2017; 59(4):e41–e45. *doi : <http://dx.doi.org/10.1097/JOM.0000000000000972>*