Original Research Article

Knowledge and Practice of universal precautions among nursing students & staff in Santosh Medical College & Hospital District, Ghaziabad

Atish Anand[1*], Ravi Kant Sehgal[2]

[1] Assistant Professor, Santosh Medical College, Ghaziabad,U.P., India
[2] Professor, Santosh Medical College, Ghaziabad,U.P., India

Received: 26-10-2020 / Revised: 25-11-2020 / Accepted: 17-12-2020

Abstract

Background: "Universal precautions" is the international term used by the medical industry to describe the set of measures introduced to allow medical staff to safely handle material that may carry blood or body fluids infected with diseases."Universal precautions" are designed to prevent infection from inoculation; contact with mucous membranes such as mouth or eye, or through skin damages such as cuts. Nurses constitute the largest percentage of the health care workers. By using simple techniques of universal precautions nurses can avoid dangerous occupational hazards and the knowledge of prevention of blood borne diseases can make them confident to deal with patients suffering from HIV and HBV. So, this study was planned to assess the knowledge and evaluate the practices of universal precautions among the nursing staff.**Methodology:** This cross-sectional study was conducted among nursing staff of SMC&H. The study period was two months with 50 sample size. Data was collected with the help of structured questionnaire. Data was compiled in Microsoft excel & analysis was done by using SPPS version 20.**Results:** About 84% of the staff nurses had knowledge regarding blood route transmission of HIV ($p<0.05$). Nearly 74% of them had knowledge regarding HCV ($p=0.001$). About 66% of them had knowledge regarding blood route transmission of HBV($p=0.024$). Statistically significant results were obtained for hand washing with soap and water as well as antiseptic.**Conclusion:** Interventions to improve Universal Precautions compliance among HCWs in tertiary health care facilities in India are urgently needed. A multifaceted approach promoting positive perception of UPs compliance should include training (initial and periodic), adequate supply of PPE, provision of hepatitis B vaccination and development of appropriate infection control and injury surveillance programmes.

Keywords: Universal precautions, nursing staff , occupational hazards, simple techniques.

Introduction

"Universal precautions" is the international term used by the medical industry to describe the set of measures introduced to allow medical staff to safely handle material that may carry blood or body fluids infected with diseases."Universal precautions" are designed to prevent infection from inoculation; contact with mucous membranes such as mouth or eye, or through skin damages such as cuts. [1] UPs are based on the basic principle of infection control through hand-washing, safe handling of needles and utilization of appropriate protective barriers such as gloves, mask, gown, and eyewear. Hand hygiene is recognized as the leading measure to prevent cross transmission of microorganisms [2] and to reduce the incidence of health care associated infections. [3] In 1983, the US Center for Disease Control and Prevention(CDC) recommended blood and body fluid precautions when a patient was known or suspected to be infected with blood-borne pathogens.[4,5] In 1987, the CDC recommended that regardless of patient's infection status, the precautions must be consistently used. This extension of blood and body fluid precautions to all

**Correspondence*
Dr. Atish Anand
Assistant Professor, Santosh Medical College, Ghaziabad, U.P., India.
E-mail: dratish.anand@gmail.com

patients is referred to as "universal blood and body fluid precautions" or simply "universal precautions." [6,7] These are precautions that should be practiced by all clinical staff without exception, to limit the risk of potentially harmful organisms being transmitted to the patient, healthcare worker, visitor or the environment. Standard precautions include hand hygiene, Use of personal protective equipment (PPE), Safe management and disposal of sharps, Safe disposal of clinical waste, Cleaning and decontamination of reusable equipment, Maintenance of a clean clinical environment, Safe management of laundry, Safe management of body fluid spillages. [8]Infection is an occupational risk for healthcare staff. Exposure to blood and body fluids from infected patients poses a risk of infection with hepatitis B, C or human immunodeficiency virus (HIV) to healthcare staff. Patients may get infected mainly by transmission of contaminated blood or blood products. Infection through contaminated medical equipment is also possible. Health care workers are at a high risk of needle stick injuries and blood-borne pathogens as they perform their clinical activities in a hospital. [9] They are exposed to blood-borne infections by pathogens from sharp injuries and contacts with blood and other body fluids. [10,11]The level of practice of standard precautions may differ from one type of health care worker to another. The differences in knowledge of universal precautions by health care workers may be influenced by their type of training. Universal precautions' awareness education has not been due importance among health care workers, particularly in developing countries. Healthcare-associated pathogens are generally transmitted via the contaminated hands of healthcare workers. Hand hygiene has long been considered one of the most important infection control measures to prevent healthcare-associated infections. However, compliance of health care workers with recommended hand hygiene procedures has remained unacceptable concern, with compliance rates generally below 50% for hand hygiene opportunities. [12] Thus, there is an urgent need for both nationally and internationally agreed codes of safe practice to be inculcated and the development of guidelines for the medical surveillance of health workers. [13] Nurses constitute the largest percentage of the health care workers. [14] By using simple techniques of universal precautions, nurses can avoid dangerous occupational hazards and the knowledge of prevention of blood borne diseases can make them confident to deal with patients suffering from HIV and HBV. So, this study was planned to assess the knowledge and evaluate the practices of universal precautions among the nursing staff.

Material & Methods

Study location/ Population: Nursing Staff & Students of Santosh Medical College & Hospital.

Inclusion Criteria

(1) Nurses available in hospital in morning shift.

(2) Nurses ready to participate in study was included.

Exclusion Criteria

(1) Nurses not given written consent.

Study Design: Descriptive cross sectional study.

Study Period: 2 months.

Sample Size: 50 nurses.

Sampling Method: The list of Nursing Staff was obtained from Nursing Superintendent office. The subjects were selected randomly by the process of simple random sampling with the help of computer generated random numbers.

Study tool: A well designed structured questionnaire after pre-testing and validation was used to collect the information from the Nursing Staff.

Statistical Analysis: Data was compiled in Microsoft excel and was analysed by using SPSS version 20.

Results

Thirty one(62%) nurses were qualified in GNM, followed by 18(36%) who did B.sc nursing and only one of them was M.sc .

Table 1: Department wise distribution of staff nurses

Department	Number	Percentage
Emergency	06	12%
Medicine	12	24%
Surgery & Allied	17	34%
Gynaecology	08	16%
Paediatrics	07	14%
Total	50	100%

Table 1 shows the distribution of staff nurses according to their Department. Among 50, 12 were from Internal Medicine department, followed by 09 from surgery, 8 from Gynae,07 from Paediatrics and least that 1 from Dental clinic.

Table 2: Distribution of staff nurses on basis of their knowledge of blood route transmission of hiv, hbv, hcv

Knowledge	Number	Percentage
Blood route transmission of HIV		
Yes	42	84.00
No	08	16.00
Total	50	100.00
X^2= 23.120 DF=1 p= <0.05		
Blood route transmission of HBV		
Yes	33	66.00
No	17	34.00
Total	50	100.00
X^2=5.120 DF=1 p=0.024		
Blood route transmission of HCV		
Yes	37	74.00
No	13	26.00
Total	50	100.00
X^2=11.520 DF=1 p= 0.001		

Table 2 shows that 84% of them had knowledge regarding blood route transmission of HIV. The knowledge of staff nurses regarding blood route transmission of HIV was found to be statistically significant. ($p< 0.05$). 66% of the staff nurses had knowledge regarding blood route transmission of HBV. The knowledge of staff nurses regarding blood route transmission was found to be statistically significant. ($p=0.024$). 74% of them had knowledge regarding blood route transmission of HCV. The knowledge of staff nurses regarding blood route transmission of HCV was found to be statistically significant. ($p=0.001$)

Table 3: Distribution of staff nurses on basis of their practice of hand washing

Practice of Hand Washing	Number	Percentage
Soap and Water	12	24.00
Antiseptic	13	26.00
Both	25	50.00
Total	50	100.00

X^2=6.280 DF=2 p= 0.04

Table 3 shows that 50% of the staff nurses washed their hands with soap water and antiseptic both while 24% of them used soap water only and 26% of them washed their hands with antiseptic only. ($p=0.04$)

Table 4: Distribution of staff nurses on basis of personal protection used

Personal Protection	Number	Percentage
Gloves	7	14.0
Apron	5	10.0
Gloves, Apron, Mask	38	76.0
Total	50	100.0

X^2=41.080 DF=2 p=0.000

Table 4 shows that 14% of them were using only gloves. 10% of them used only gloves and 76% of them used gloves, apron and mask as personal protective measure. The use of Personal protective equipment was found to be statistically significant. ($p=0.000$)

Table 5: Distribution of staff nurses on basis of cleaning spillage

Cleaning Spillage	Number	Percentage
Soap and water	09	18.00
Sodium hypochlorite	41	82.00
Total	50	100.00

X^2=20.480 DF=1 p=0.000

Table 5 shows that 82% of the staff nurses use sodium hypochlorite for cleaning spillage .18% of them used only soap and water for above purpose. The practice of cleaning spillage was found to be statistically significant. (p=0.000)

Discussion

In the present study 84% of the staff nurses had knowledge regarding blood route transmission of HIV. The knowledge of staff nurses regarding blood route transmission of HIV was found to be statistically significant. ($p<0.05$) This is in concordance with the findings of the findings of the study carried out by Devaliya JJ et al (2014) among 52 nursing staff in one of the tertiary care hospitals of Western India according to which all of the participants were aware regarding blood route transmission of HIV. [24]Hess et al (2006) found that there are a few gaps in the knowledge of respondents regarding modes of HIV transmission. Some stated that contact of intact skin with HIV infected samples carries a risk of getting infected but this is not true. This suggests that there is the need for continuing professional development sessions to constantly remind the hospital staff of some facts about HIV. [18] In the present study, 66% of the subjects had knowledge regarding blood route transmission of HBV while 34% of them didn't have. The knowledge of staff nurses regarding blood route transmission of HBV was found to be statistically significant. (p=0.024). Punia et al (2014) carried out a study among 162 HCWs who reported varying degrees of compliance with standard precautions. Despite a perceived risk of exposure to blood-borne infections, 8% of the HCWs had not completed the hepatitis B vaccination schedule. [26It was seen that 50 % of the staff nurses wash their hands with soap water and antiseptic both while 24% of them wash with soap and water and 26% of them with antiseptic alone. The practice of hand washing was found to be statistically significant. (p=0.04) Devaliya JJ et al (2014) reported that even though all the nurses knew about hand washing, enquiry regarding practice of the same showed that only 40% washed their hands every time after attending the patient, while in case of hand washing with anti-septic this proportion further decreased to 15%. [24Punia et al (2014) reported that most of the subjects declared the use of hand rub (95%). [26]In the current study, it was observed that three fourth of the staff nurses use both gloves and apron as personal protective equipment. (p=0.000) Punia et al (2014) reported that gloves were used by 77% of the staff and only 22% and 28% reported use of protective eye gear and outer protective clothing respectively. [26]It was found that 82% of the study subjects use sodium hypochlorite for cleaning Spillage while only 28% of them use only soap and water. The practice of using sodium hypochlorite for cleaning spillage was found to be statistically significant. (p=0.000)Devaliya JJ et al (2014) reported that almost all the nurses (98.08%) cleaned spillage of body fluids with anti-septic. [24]

Conclusion

Interventions to improve Universal Precautions compliance among HCWs in tertiary health care facilities in India are urgently needed. A multifaceted approach promoting positive perception of UPs compliance should include training (initial and periodic), adequate supply of PPE, provision of hepatitis B vaccination and development of appropriate infection control and injury surveillance programmes.

References

1. Evanoff, Bradley MD, Kim, Lynn, Sunita, Mutha et al. Compliance with universal precautions among emergency department personnel caving for trauma patients. Journal of the American college of emergency physicians.1999; 33 (2):160-5.
2. Pittet D, Hugonnet S, Harbarth S, Mourouga P, Sauvan V, Touveneau S, et al. Effective-ness of a hospital-wide programme to improve compliance with hand hygiene. Lancet 2000; 356(9238): 1307-12.
3. Boyce JM, Pittet D. Guideline for hand hygiene in health-care settings. Recommend-ations of the healthcare infection control practices advisory committee and the HIC- PAC/SHEA/ APIC/IDSA hand hygiene task force. Morbidity and Mortality Weekly Report 2002; 23(12): S3-S40.
4. Centers for Disease Control (CDC). Recommend-ations for protection against viral hepatitis. MMWR Morb Mortal Wkly Rep 1985; 34: 313-24.
5. Centers for Disease Control (CDC). Recommendations for preventing transmission of infection with human T-lymphotropic virus type III/ lymphadenopathy-associated virus in the workplace. MMWR Morb Mortal Wkly Rep 1985; 34:681-6.
6. McCarthy GM. Universal precautions. J Can Dent Assoc 2000;66: 556-7.
7. Centers for Disease Control (CDC). Update: Human immunodeficiency virus infections in health-care workers exposed to blood of infected

patients. MMWR Morb Mortal Wkly Rep 1987;36:285-9.
8. Garner JS. Guideline for isolation precautions in hospitals. The Hospital Infection Control Practices Advisory Committee. Infect Control Hosp Epidemiol 1996;17: 53-80.
9. Beltrami EM, Williams IT, Shapiro CN.. Risk and management of blood-borne infections in health care workers. Clin Microbiol Rev 2000;13:385-407.
10. Gerberding JL. Incidence and prevalence of human immunodefi ciency virus, hepatitis B virus, hepatitis C virus, and cytomegalovirus among health care personnel at risk for blood exposure: Final report from a longitudinal study. J Infect Dis 1994;170:1410-7.
11. Ruben FL, Norden CW, Rockwell K, Hruska E. Epidemiology of accidental needle-puncture wounds in hospital workers. Am J Med Sci 1983;286:26-30.
12. Pittet D, Mourouga P, Perneger TV; Compliance with hand washing in a teaching hospital. Ann Intern Med 1999; 130(2):126-30.
13. NACO guideline (revised) March 2007 (based on CDC Public Health Service guidelines for management of health-care worker exposures to HIV and recommendations for post exposure prophylaxis. MMWR. 2005; 54(RR09): 1-17.
14. Buerhaus PI, Auerbach DI, Staiger DO. Recent trends in the registered nurse labor market in the U.S.: Short-run swings on top of long-term trends. Nurs Eco 2007; 25(2): 59-66.
15. Shinde M., Anjum S. (2007). Educational Methods and Media for Teaching in Practice Of Nursing. Sneha Publication India (Dombivili)
16. Sadoh WE, Fawole AO, Sadoh AE, oladimeji AO. Practices of universal precautions among health care workers. Journal of National Medical Association 2006 ; 98(5): 722-6.
17. Sadoh WE, Fawole AO, Sadoh AE, Oladimeji AO, Practice of Universal Precautions among Healthcare Workers. Journal of The National Medical Association. 2006; 98 (5):722-6.
18. Hesse AAJ, Aryee A, Mensah K, Wu L. Knowledge, attitude and practice universal basic precautions by medical personnel in a teaching hospital. Ghana Medical Journal 2006; 40: 61-4.
19. Kaur R, Kaur B, Walia I.Knowledge, Attitude and Practice Regarding Universal Precautions among Nursing Students. Nursing and Midwifery Research Journal,2008; 4(4): 115-27.
20. Kotwal A, Taneja DK. Health Care Workers and Universal Precautions: Perceptions and Determinants of Non-compliance. Indian J Community Med [serial online] 2010 [cited 2017 Mar 21]. Available from: http://www.ijcm.org.in/text.asp?2010/35/4/526/74373.
21. Sreedharan J, Muttappillymyalil I, Venkatramana M. Knowledge about standard precautions among university hospital nurses in the United Arab Emirates. Eastern Mediterranean Health Journal. 2011; 4 (17): 331-4.
22. Mudedla S, Tej LW, Reddy KT.A study on knowledge and awareness of standard precautions among health care workers at Nizam's institute of medical sciences Hyderabad. The Journal of National Accreditation Board for Hospitals and Health care providers 2014: 1(2): 34-8.
23. Sharma BK, George S. Role of knowledge in practicing universal precautions among staff nurses. International Journal of Medical Science Research and Practice 2014; 1(2): 44-9.
24. Kale M, Ghopal M, Shinde M. Knowledge and Practices of Universal Precautions among Basic B.Sc. Nursing Students. International Journal of Science and Research 2014; 3(6): 1862-70.
25. Devaliya JJ, Brahme K, Shringarpure K. A Study on Knowledge, Attitude and Practice (KAP) of Universal Precautions in The Nursing Staff of Tertiary care Hospital. Sch. J. App. Med. Sci., 2016; 4(7A): 2368-71.
26. Punia S, Nair S, Shetty R S. Health Care Workers and Standard Precautions: Perceptions and Determinants of Compliance in the Emergency and Trauma Triage of a Tertiary Care Hospital in South India. International Scholarly Research Notices. 2014:1-5.

Conflict of Interest: Nil
Source of support:Nil