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**Original Research Article**

# Factors influencing observation of standard precautions among nursing staff in tertiary care setting in Mangalore

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## ABSTRACT

**Background:** Health care professionals and particularly nurses are often exposed to microorganisms, many of which can cause serious infections. Although the potential for HBV transmission in the workplace setting is greater than for HIV, the mode of transmission for these two viruses are the same. Because of the environment in which they work, many health care workers are at an increased risk of accidental needle stick injuries (NSI) and blood borne pathogens such as HIV, Hep B, and HCV. The objectives of the study were to assess the knowledge, attitude and practice of standard precautions among nursing staff working in 5 tertiary care hospitals attached to teaching institutions in Mangalore and to assess the factors associated with non-compliance with standard precautions among nurses
**Methods:** The study was done in 5 tertiary care hospitals attached to teaching institutions in Mangalore among the working nursing staff in these hospitals. A pre-tested questionnaire was used to collect the information regarding knowledge, attitude and practice and the reasons for non-adherence to standard precautions.
**Results:** Regarding standard precautions 66.7% had a good knowledge, 74.7% had good practice and 87.3% had a positive attitude towards it. 26.34% attributed noncompliance to excess workload. Increasing age and increase in duration of nursing practice showed a significant increase in KAP scores.
**Conclusions:** The duration of nursing practice influenced the knowledge and the compliance to standard precautions.

**Keywords:** Standard precautions, Nursing staff, KAP score

## INTRODUCTION

Hospital associated infections (HAI) are an important public health problem. HAI can occur in both the patients as well as the people involved in patient care. Health care professionals and particularly nurses are often exposed to microorganisms, many of which can cause serious or even lethal infections.[1] Although the potential for HBV transmission in the workplace setting is greater than for HIV, the mode of transmission for these two viruses are the same. According to a WHO study, the annual estimated proportions of health care workers exposed to blood borne pathogens globally were 2.6% for HCV, 5.9% for HBV and 0.5% for HIV worldwide.[2] Because of the environment in which they work, many health care workers are at an increased risk of accidental needle stick injuries (NSI) and blood borne pathogens such as HIV, Hep B, and HCV. It is important that health workers have adequate knowledge regarding universal precautions since they are at an increased risk of acquiring infections as mentioned above.

In 1985, largely because of the HIV epidemic, isolation practices in the United States were altered dramatically by the introduction of a new strategy for isolation precautions, which became known as universal

precautions (UP). "Universal blood and body-fluid precautions" or "universal precautions" as defined by CDC, refer to a set of precautions designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other blood borne pathogens in health-care settings.[3] Now these universal precautions are called standard precautions. Standard precautions apply to (1) blood; (2) all body fluids, secretions, and excretions except sweat, regardless of whether or not they contain visible blood; (3) non-intact skin; and, (4) mucous membranes. Standard precautions are applied to all patients irrespective of their infection status and are designed to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection in hospitals.[4]

The three infections most commonly transmitted to health care workers are hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). Among the 35 million health care workers worldwide, about three million receive percutaneous exposures to blood borne pathogens each year; 2 million of those to HBV, 0.9 million to HCV and 170 000 to HIV. These injuries may result in 15 000 HCV, 70 000 HBV and 500 HIV infections.[5] More than 90% of these infections occur in developing countries. Worldwide, about 40% of HBV and HCV infections and 2.5% of HIV infections in health care workers are attributable to occupational sharps exposures. These infections are for the major part preventable, as shown by the low rates achieved in certain countries that have engaged in serious prevention efforts, including training of health care workers, HBV immunization, post-exposure prophylaxis and improved waste management. In addition to the disease burden caused to health care workers, the functioning of the health care system may be reduced because of impaired working capacity, in particular in developing countries where the proportion of health care workers in the population is already small compared with that in developed countries.[5]

Despite evidence that occupational exposure poses great health risks we do see a lot of these injuries among health care workers. This shows that there is a lot of difference in the perceived risks among the health care workers. Hence it becomes important for us to know the various reasons for their noncompliance with the standard rules. This study thus makes an attempt to understand the various factors associated with noncompliance to universal precautions. This study was done to assess the knowledge, attitude and practice of universal precautions among nursing staff and the factors associated with non-compliance with universal precautions.

## METHODS

### *Study site*

Mangalore taluk is known for its many tertiary care hospitals, nursing homes and medical teaching institutions. This was a cross sectional study conducted at 5 tertiary care hospitals attached to teaching institutions in Mangalore.

### *Study population and sample size*

The study population were the working nursing staff in these tertiary care hospitals. Prevalence of knowledge as per previous studies was 80%.[6] Taking this as P, 5% of allowable error and 10% as non-responders we calculated the final sample size of 300 nursing staff using the formula n= $\{Z^2 * P (1–P)\}/e^2$ was calculated.

Z– 1.96 for 95% CI
P– Expected true proportion
E– desired precision (1/2 the width of CI)

Depending upon the available nursing staff in each of the institution's the population proportion to sample size of 27% from A,14% from B, 16% from C, 13% from D and 30% from E institution was taken. Participants were selected by simple random sampling. The study was conducted for a period of 3 months from January 2013 to March 2013. Complete anonymity regarding names of the institutions and the study participants was ensured. All nursing staff willing to participate in the study were included after obtaining informed consent with prior permission from the head of institution and nursing superintendent of the respective institution. Ethical clearance and approval was obtained from the college ethics committee.

### *Study tool*

A pre-tested validated self-administered questionnaire was used to collect the data. Information regarding knowledge, attitude, practice and their reasons for non-adherence to universal precautions was collected using the questionnaire. Content of the questionnaire was based on standard precaution guidelines and relevant questions to everyday practice of the nursing staff.

### *Data management*

There were 3 knowledge questions, 10 practice questions and 4 attitude questions. Each of these questions were given weighted scores and the final scores for knowledge, attitude and practice was computed. Data was entered in excel and managed in SPSS. Descriptive statistics was used to represent the data. Kruskal Wallis test was used for computing KAP scores as against various variables. Data has been expressed in tables.

## RESULTS

Majority of the nurses were females (n=265, 88.3%). Educational qualification of most of the nurses (n=174, 58%) was general nursing and midwifery followed by B. Sc. nursing (n=118, 39.4%) and M. Sc. nursing (n=8, 2.6%). Majority of the study participants followed

standard precautions always (Table 1). 66.7% had a good knowledge, 74.7% had good practice and 87.3% had a positive attitude towards standard precautions (Table 2). Knowledge, practice and attitude scores varied significantly across age groups, duration of nursing practice and source of information of standard precautions (Table 3-5). Out of the total noncompliance, excess workload (26.34%) stood as the main reason for not following the standard precautions followed by inadequate supply (25%) and time consuming (25%) as factors. Even lack of protective equipment was stated as causative factor by 23.66% (Table 6).

**Table 1: Distribution of participants according to compliance with standard precautions.**

| Follow SP (standard precautions) | Always (%) | Sometimes (%) | Never (%) |
|---|---|---|---|
| **Follow SP (standard precautions) while drawing blood** | 182 (60.7) | 112(37.3) | 6(2) |
| **Follow SP (standard precautions) while starting an IV line** | 165 (55) | 121 (40.3) | 14 (4.7) |
| **Follow SP (standard precautions) while controlling bleeding** | 231 (77) | 66 (22) | 3 (1) |
| **Follow SP (standard precautions) while doing an endotracheal intubation** | 258 (86) | 39 (13) | 3 (1) |
| **Follow SP (standard precautions) while doing oro- nasal suctioning** | 257 (85.7) | 39 (13) | 3 (1) |
| **Follow SP (standard precautions) while handling and cleaning instruments with microbial contamination** | 265 (88.3) | 33 (11) | 2 (0.7) |

**Table 2: Knowledge, attitude and practice regarding standard precautions.**

| | Good n (%) | Poor n (%) |
|---|---|---|
| **Knowledge** | 260 (66.7) | 40 (13.3) |
| **Practice** | 324 (74.7) | 76 (25.4) |
| | **Positive n (%)** | **Negative n (%)** |
| **Attitude** | 262 (87.3) | 38 (12.7) |

**Table 3: Knowledge attitude and practice score with respect to age groups.**

| Age group | Number | Knowledge score (mean rank) | Practice score (mean rank) | Attitude score (mean rank) |
|---|---|---|---|---|
| **20–29** | 238 | 141.58 | 145.75 | 134.15 |
| **30–39** | 35 | 178.87 | 141.61 | 163.54 |
| **40–49** | 20 | 189.00 | 213.28 | 178.50 |
| **≥50** | 7 | 202.00 | 177.14 | 156.71 |
| **Total** | 300 | | | |
| **Chi square** | | 17.930 | 13.747 | 10.665 |
| **df** | | 3 | 3 | 3 |
| **Asymp.sig** | | 0.000 | 0.003 | 0.014 |

**Table 4: Knowledge, attitude and practice score with respect to duration of nursing practice.**

| Duration of nursing practice (in years) | Number | Knowledge score (mean rank) | Practice score (mean rank) | Attitude score (mean rank) |
|---|---|---|---|---|
| **0-0.99** | 57 | 155.54 | 132.61 | 124.91 |
| **1–5** | 168 | 136.43 | 145.43 | 134.27 |
| **5.1–10** | 24 | 148.54 | 155.77 | 151.88 |
| **10.1–15** | 26 | 182.65 | 157.50 | 166.77 |
| **15.1-20** | 16 | 202 | 225.47 | 193.75 |
| **>20** | 9 | 202 | 190.89 | 168.33 |
| **Total** | 300 | | | |
| **Chi square** | | 24.070 | 19.310 | 16.899 |
| **df** | | 5 | 5 | 5 |
| **Asymp. sig** | | 0.000 | 0.002 | 0.005 |

**Table 5: Knowledge, attitude and practice score with respect to source of information.**

| Source of information | Number | Knowledge score (mean rank) | Practice score (mean rank) | Attitude score (mean rank) |
|---|---|---|---|---|
| **Nursing college** | 20 | 145.73 | 114.05 | 128.92 |
| **Hospital where working** | 58 | 136.00 | 154.18 | 155.64 |
| **Media** | 5 | 12.80 | 125.50 | 32.20 |
| **Nursing college and hospital** | 81 | 138.38 | 153.57 | 146.41 |
| **Nursing college and media** | 11 | 116 | 137.64 | 105.17 |
| **Hospital and media** | 15 | 152.63 | 148.03 | 93.33 |
| **Nursing college, hospital and media** | 106 | 172.78 | 150.29 | 142.43 |
| **Total** | 296 | | | |
| **Chi square** | | 35.88 | 4.911 | 23.00 |
| **df** | | 6 | 6 | 6 |
| **Asymp. sig** | | 0.000 | 0.555 | 0.001 |

**Table 6: Reasons for non-compliance with standard precautions.**

| Reasons | Percentage (%) |
|---|---|
| **Excess workload** | 27.32 |
| **No adequate supply** | 24.5 |
| **Time consuming** | 24.5 |
| **Lack of protective equipment** | 23.66 |

## DISCUSSION

Standard precautions are basic level of precautions which are recommended when delivering care to patients.[7] Many studies have been carried out at regional, national and international level to assess the knowledge of nurses towards standard precautions. In addition to assessing the knowledge of nurses our study has also tried to find out the reasons for noncompliance with the standard precautions as well as find other factors contributing to the knowledge. Age as a factor has not been extensively studied to affect the compliance with standard precautions. However, the findings in this study suggest that age does have an impact and older individuals are more likely to comply as compared to the younger individuals.

Majority of the study nurses followed standard precautions always which were also seen in other studies.[8] Adherence to standard precautions is an important determinant in the occurrence of needle stick injuries and exposure to hospital acquired infections. Most of the noncompliance was seen while starting an IV line which could have a relation to excess patient load as the hospitals in which this study was conducted as all of them were tertiary care hospitals. A study done by Efstathiou et al has shown inadequate compliance concerning hand hygiene guidelines with precautions among nurses in order to avoid exposure to microorganisms use of gloves when exposure to body fluids was anticipated.[1] Another study has also shown that perceived barriers to compliance with UPs clearly influence HCW's ability and willingness to comply with them in practice.[9] Inability to use PPE during emergencies, overwork and busy schedules have also been shown in similar settings.

The findings in this study show that as the duration of nursing practice increased there is an increase in knowledge as well. The compliance with standard precautions is also better with an increase in duration of nursing practice also seen in another study where duration of employment played a role in awareness of standard precautions.[10] Source of information is also seen to play a very important role in influencing the knowledge, attitude and practice of the nurses in our study. The scores are highest for those who have information from nursing college, hospital and the media all three included. Though not many studies have looked into this aspect, our study findings have been significant in relation to knowledge and attitude scores.

### *Limitations*

This study lacked systematic sampling which could have introduced bias in the study. A more effective method of measuring compliance would have been to observe the nurses practice but this was not taken up due to feasibility issues.

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## REFERENCES

1. Efstathiou G, Papastavrou E, Raftopoulos V, Merkouris A. Factors influencing nurses' compliance with Standard Precautions in order to avoid occupational exposure to microorganisms: A focus group study. BMC Nurs. 2011;10:1.
2. WHO. The world health report 2002 - Reducing Risks, Promoting Healthy Life. Available at: http://www.who.int. Accessed on 1 May 2013.
3. Sharma R, Rasania S, Verma A, Singh S. Study of prevalence and response to needle stick injuries among health care workers in a tertiary care hospital in Delhi, India. Indian J Community Med. 2010;35(1):74.
4. Guidelines for Isolation Precautions in Hospitals. Available at: http://wonder.cdc.gov. Accessed on 1 May 2013.
5. Kotwal A, Taneja D. Health Care Workers and Universal Precautions: Perceptions and Determinants of Non-compliance. Indian J Community Med. 2010;35(4):526–8.
6. Rashmi, Sanjeev B. Knowledge of Universal Precautions among nursing staff of a tertiary care centre. Presented in National conference of healthcare and safety, 2011.
7. Van Der BL, Daniels F. Do nursing students know and practise the Universal Precautions to prevent transmission of infectious agents? Curationis, North America, 36, 2013. Available at: http://www.curationis.org.za/index.php/curationis/article/view/99/1194. Accessed on 1 September 2014.
8. Sadoh WE, Fawole AO, Sadoh AE, Oladimeji AO, Sotiloye OS. Practice of universal precautions among healthcare workers. J Natl Med Assoc. 2006;98(5):722–6.
9. Suchitra J, Lakshmi Devi N. Impact of education on knowledge, attitudes and practices among various categories of health care workers on nosocomial infections. Indian J Med Microbiol. 2007;25(3):181.
10. Vaz K, McGrowder D, Alexander-Lindo R, Gordon L, Brown P, Irving R. Knowledge, awareness and compliance with universal precautions among health care workers at the University Hospital of the West Indies, Jamaica. Int J Occup Environ Med. 2010;1(4):171–81.

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