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ORIGINAL ARTICLE

# Knowledge and practice of standard precautions among healthcare workers of tertiary hospital of Banke district, Nepal

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## Abstract

**Introduction:** The healthcare workers are at risk of occupational exposure to blood or air-borne pathogens through contact with human blood, droplets and other body fluids. World Health Organization standardized the precautionary measures which prevent them from contracting and spreading infections among patients or into the community. This study was undertaken to assess the knowledge and practice of standard precautions among the healthcare workers.

**Method:** This is a hospital based observational cross-sectional study done over a period of six months (August 2021 to January 2022) at Nepalgunj Medical College Teaching Hospital which includes 422 participants. The information was recorded via semi-structured proforma. Data were entered in Microsoft Excel 20.

**Result:** The study shows 294 (70%) participants had adequate knowledge about hand hygiene but the practice was found to be 64 (52%), 152 (67%) and 39 (52%) in doctors, nurses and house-keeping staff respectively. The participants, who safely practiced the use of gloves, were 299 (71%). The use or change of masks in each work shift among doctors, nurses and house-keeping staff was found to be 68 (56%), 103 (46%) and 33 (45%) respectively. Only 16 doctors and 109 nurses were trained regarding standard precautions. The study participants responded the hygiene materials were not adequately provided during each work shift.

**Conclusion:** The strategies to facilitate the standard precaution practice should be adopted to ensure prevention of nosocomial transmission of infection. The training programs, provision of hygiene materials and regular supervision will clear the gaps in knowledge and practice of standard precautions.

**Keywords:** Healthcare Workers; Infection Control; Standard Precautions.

## INTRODUCTION

A healthcare worker, who provides care and services to the sick and ailing patients, could be doctors, nurses, or medical waste handlers. In any setting where health care is delivered, 'Standard Precautions' are the infection prevention strategies applied with the objective to protect healthcare workers and prevent them from spreading infections among patients. Standard precautions include:

1. Hand hygiene
2. Use of personal protective equipment (e.g., gloves, masks, eyewear)
3. Respiratory hygiene / cough etiquette
4. Sharps safety (engineering and work practice controls)
5. Safe injection practices (i.e., aseptic technique for parenteral medications)
6. Sterile instruments and devices
7. Clean and disinfected environmental surfaces.[1]

These measures minimize the risk of potential exposure to blood, all body fluids, secretions, and excretions (except sweat), non-intact skin, and mucous membranes.[2]

Nearly 2.5% of human immunodeficiency virus (HIV) cases and 40% of Hepatitis B and C cases among health care workers resulted from sharp injuries and contact with body fluids.[3,4] The strict compliance with standard precautions has not only protected the health care workers from such infections, but also prevented the spread of respiratory viral infection (e.g., SARS-CoV, avian influenza, pandemic influenza).[5,6] This study aims to find the knowledge of standard precautions among different healthcare workers and whether those are being practiced.

## METHOD

This is a hospital-based cross-sectional study conducted over a period of six months (August 2021 to January 2022) at Nepalgunj Medical College, Kohalpur after obtaining an ethical clearance from Institutional Review Committee in August, 2021. A total of 422 participants, including doctors, nurses and house-keeping staffs were included in the study after informed consent. Information on different aspects of standard precautions, including hand hygiene, use of gloves, respiratory hygiene, contact precautions, sharps safety and disinfection/sterilization was recorded using a semi-structured proforma. Data were analyzed using Microsoft excel 2010 and standard statistical software SPSS 20.0. Descriptive statistics used were frequency and percentage.

## RESULT

In this study, 422 healthcare workers participated which included 123 doctors, 225 nurses and 74 house-keeping staffs. A total of 294 participants (70%) had adequate knowledge about hand washing. They responded

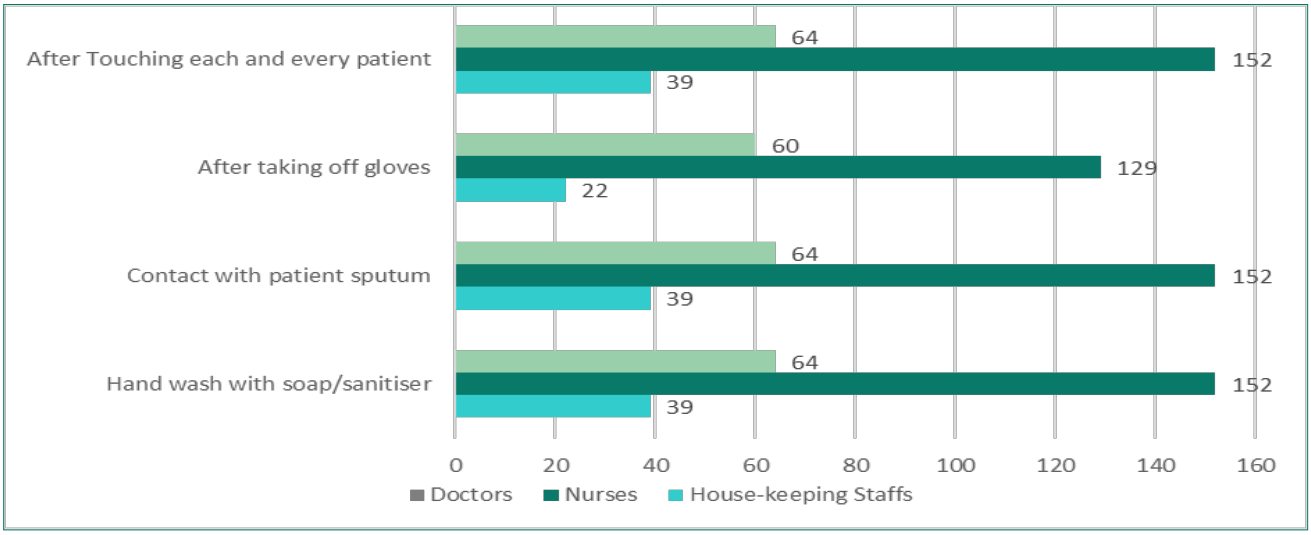


**Figure 1. Practice of hand wash among healthcare workers**

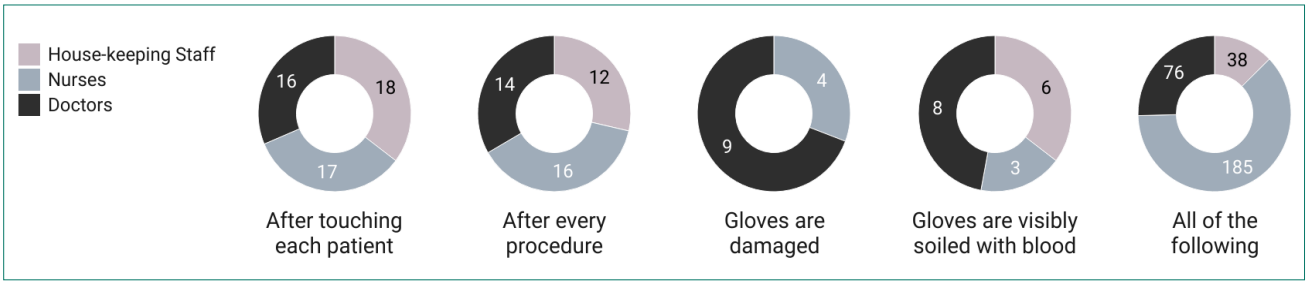


**Figure 2. Practice on change of gloves among healthcare workers**

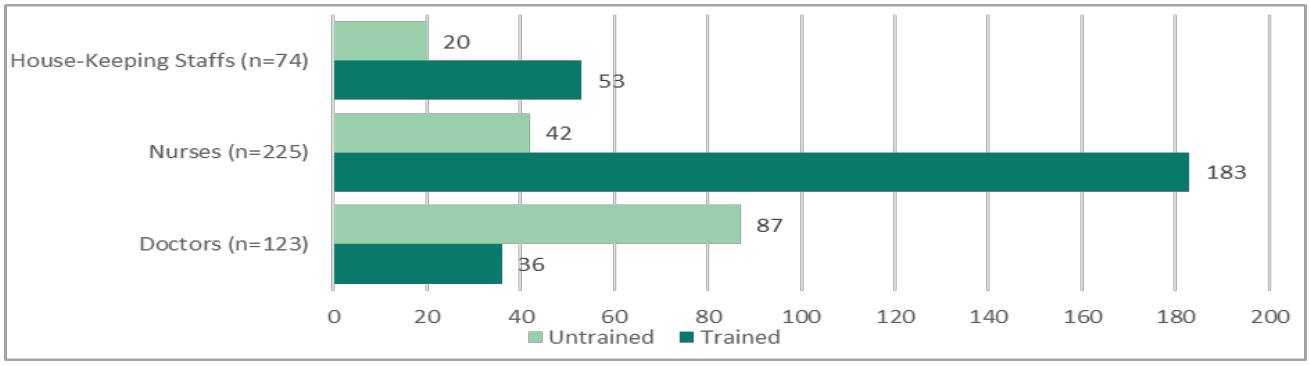


**Figure 3. Donning and doffing of personal protective equipment**

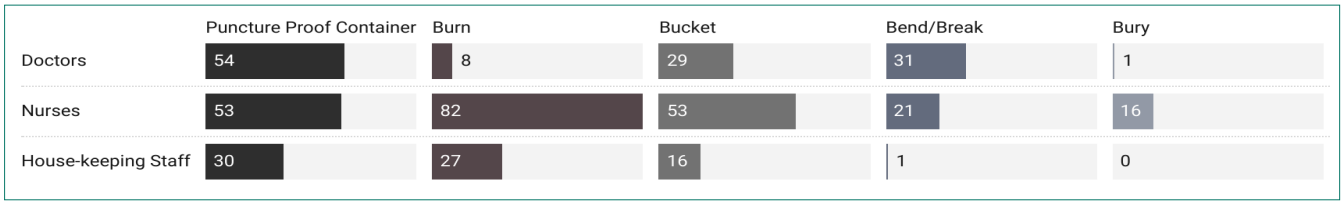


**Figure 4. Knowledge/practice of sharp disposal among healthcare workers**

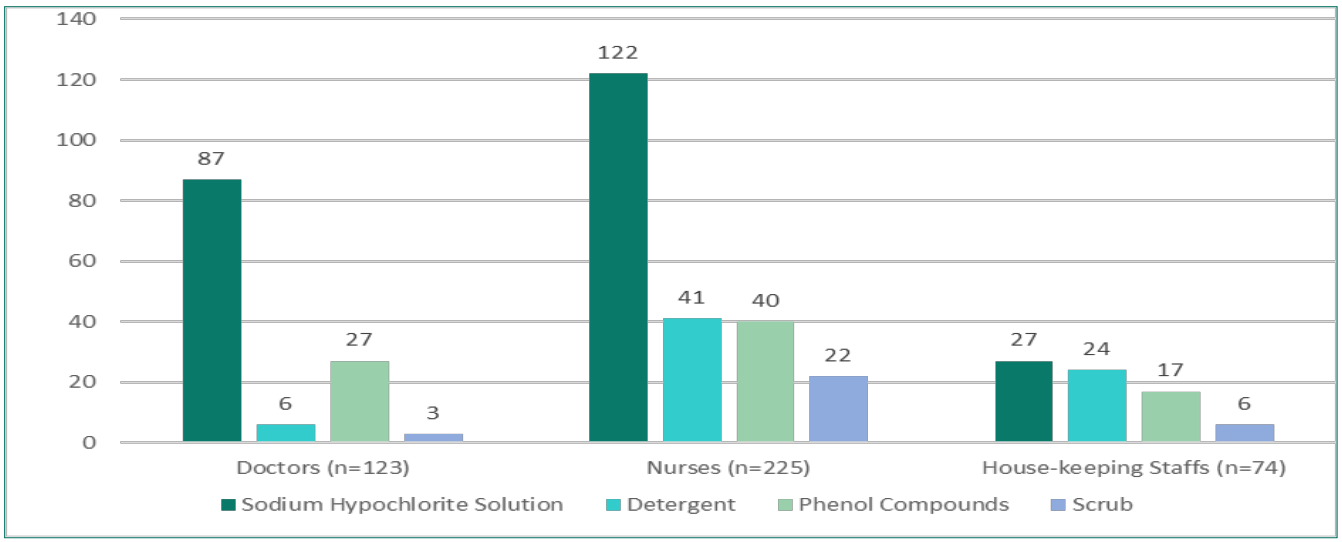


**Figure 5. Knowledge/Practice of sterilization of blood spill/sputum**

**Table 1. Acquisition of knowledge on standard precautions among healthcare workers**

| Knowledge of Standard Precautions via | Training | Lectures | Demonstrations | None |
|---|---|---|---|---|
| Doctors | 16 | 43 | 8 | 56 |
| Nurses | 109 | 4 | 13 | 99 |
| House-keeping Staff | 0 | 0 | 21 | 53 |

accurately the hand wash should be done after touching a patient, after contact with blood/body fluids and when hands were visibly soiled. However, there were varied responses regarding the practice of hand wash as illustrated in Figure 1.

This study found 299 respondents (71%) had known or practiced the change of gloves as shown in Figure 2. However, 55 doctors (45%) and 181 nurses (81%) used gloves during IV access. Among the house-keeping staff, 45 (61%) responded the use of gloves while handling soiled bed sheet.

Regarding the respiratory hygiene, 68 doctors (56%), 103 nurses (46%) and 33 house-keeping staff (45%) used/ changed the masks during their work shifts. A significant proportion of healthcare workers were trained in donning and doffing of personal protective equipment as a part of contact precautions which is illustrated in Figure 3.

In this study, 81 doctors (66%) and 158 nurses (71%) used one hand while recapping the needle safely. There was a considerable variation among the healthcare workers about the sharp disposal as illustrated in Figure 4.

The respondents, who had known/practiced sterilization of blood spill/sputum with sodium hypochlorite solution, were found to be 236 (56%) as shown in Figure 5.

The participants were also enquired about any training or demonstration they received regarding the standard precautions and the responses are tabulated in Table 1.

The availability of the resources for safe practice was also enquired with the participants in this study and the responses are shown in Table 2.

**Table 2. Availability of resources for standard precautions**

| Availability of resources | Adequate |
|---|---|
| Soap/Sanitizer | 69% |
| Gloves | 63% |
| Masks | 40% |
| Personal Protective Equipment | 95% |
| Puncture Proof Container | 52% |

## DISCUSSION

Standard precautions are an array of measures for infection control implemented to prevent disease transmission that can be disseminated by contact with blood, body fluid, and non-intact skin.[7] Such practice has proven to improve morbidity and mortality, and amplify a cost effective healthcare.[8-11] A growing body of literature has supported the notable reduction in the frequency of healthcare associated infections and thus risk in epidemics with hand hygiene,[12,13] use of masks[14-16] and personal protective equipment.[17-19]

In this study, despite the knowledge about hand hygiene and use of gloves in a sizeable percentage (>70%) of participants, there was a clear disparity in practice of such infection control measures. A significant proportion of healthcare workers did not exercise the measures like use or change of masks in each shift, proper sharp disposal and sterilization of blood spill/sputum. This study shows either inadequate knowledge or significant 'know-do' gap as one of the major hindrance to compliance with standard precautions which is consistent with many studies.[20-22] In contrast to the study done by Akagbo et al,[23] the workload during the patient care was not perceived as a limiting factor for adherence with standard precautions.

The strategies to address the gaps in knowledge and practice of standard precautions must be adopted to improve the compliance with infection control measures. Many authors have argued that training of healthcare workers on standard precautions and provision of infection prevention materials would enhance the adherence to good practice.[24,25] In a study done by Osaigbovo,[26] the author has discussed training and retraining of health care workers can be provided in the form of seminars, workshops and orientation programs. Such approach can enable positive attitude and practice.[27] Lee et al[28] inferred proper education on hand hygiene improved the practice of hand washing among healthcare workers. In a study done by Black et al,[29] the authors have suggested the protective protocols at workplace had to be prioritized to safeguard the healthcare workers.

The results of this study has pointed out there is an immediate need to focus on infection prevention mechanisms. In order to enhance the good practice, rehearsals on the components of standard precautions must be emphasized.

There are some notable limitations to this study. As this was a cross-sectional study using semi-structured questionnaires, the information provided by study participants is prone to recall bias. The practice of standard precautions among health care workers was not directly observed. Since the data were collected from a single health-care center, the study findings could not be generalized.

This study has provided an insight into the knowledge and practice of standard precautions among health care workers. The findings of the study will guide the administration to incorporate policies to improve compliance to infection prevention practices and thus, reduce the risk of disease transmission.

## CONCLUSION

This study shows there are knowledge gaps in the various components of standard precautions among the heath care workers. The arrangement of training programs will not only address such issues but also facilitate positive attitude towards correct practice. A regular worksite observation and feedback can reduce the knowledge gap as well as improve compliance to standard precautions. The provision of hygiene materials like soap/sanitizer, gloves and masks will prompt strict adherence to infection prevention practice. These strategies will ultimately lead to safe working environment for health care workers and thus, check the outspread of infections from the health-care facilities.

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