A Study to Evaluate the Effectiveness of Planned Teaching Program on Standard Precautions in Terms of Knowledge and Practices of Nursing Personnel related to Standard Precautions in Selected Government Hospital of Delhi

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Abstract

Standard precautions are meant to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources. They are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients. Nursing personnel may acquire an infection during the provision of nursing care because of occupational exposure to microorganisms. The main objectives of the study were to assess the knowledge of nursing personnel regarding standard precautions, to assess the practices of nursing personnel regarding standard precautions, develop a planned teaching program on standard precautions and determine the relationship between knowledge and practices of nursing personnel after the administration of the planned teaching program. Research approach selected for the study was quantitative approach with one group pretest-posttest design. Purposive sampling technique was used and the sample comprised of 50 nursing personnel working in a selected government hospital in Delhi. Tools used for data collection were a structured questionnaire to collect personal data and for assessing the knowledge of nursing personnel and a structured observation checklist to assess the practices of nursing personnel. The findings of the study revealed that the mean posttest knowledge score of nursing personnel was significantly higher than the mean pretest knowledge score and the mean posttest practice score of the subjects was significantly higher than the mean pretest practice score. The planned teaching program was effective in enhancing the knowledge and practice scores of nursing personnel regarding standard precautions.

Keywords: Knowledge, Practice, Standard precautions, Personal protective equipment

Introduction

Healthcare providers such as doctors, nurses, technicians etc. are more and more exposed to the professional hazards due to the working environment of the hospitals. In today’s rapidly changing healthcare environment, protecting patients and healthcare workers from pathogen transmission has become more difficult and more imperative.¹ The common biological hazards or risks, which may occur to healthcare providers (HCPs) in a hospital are hospital-acquired infections such as HIV/AIDS, hepatitis B and C, urinary tract infections (UTI), respiratory tract infections, ventilators-associated pneumonia (VAP), etc.

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Standard precautions are meant to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources. They are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients.\(^2\)

Nursing personnel may acquire an infection during the provision of nursing care because of occupational exposure to microorganisms. Relevant literature reports explain that compliance with standard precautions (a set of guidelines that can protect healthcare professionals from being exposed to microorganisms) is low among nurses.\(^3\) Additionally, high rates of exposure to microorganisms among nursing personnel via several modes (needles-stick injury, hands contamination with blood, exposure to air-transmitted microorganisms) occur.

Approximately 3 million healthcare workers (HCWs) experienced percutaneous exposure to blood-borne viruses (BBVs) each year. This results in an estimated 16,000 hepatitis C, 66,000 hepatitis B, and 200 to 5000 human immunodeficiency virus (HIV) infections annually. More than 90% of these infections are occurring in low-income countries and most are preventable.\(^4\)

India has the third-largest HIV epidemic in the world. In 2013, estimated HIV prevalence in India was 0.3% which equates to 2.1 million people living with HIV. The five states with the highest HIV prevalence are Nagaland, Mizoram, Manipur, Andhra Pradesh and Karnataka. Some states in the north and northeast of the country report rising HIV prevalence.

**Materials and Methods**

Research design used for the present study was one group pretest-posttest design. The independent variable was a planned teaching program on standard precautions for the prevention and control of hospital-acquired infections and the dependent variables were knowledge and practice scores of nursing personnel regarding standard precautions. The setting of the study was Deen Dayal Upadhyay Hospital, Hari Nagar, New Delhi. Study population was nursing personnel both male and female working in various settings of Deen Dayal Upadhyay Hospital, Hari Nagar, New Delhi. The total sample size was 50 and purposive sampling technique was used for selecting samples.

The data collection tools were a structured knowledge questionnaire and a structured observation checklist, which were used to assess the knowledge and practice of nursing personnel regarding standard precautions. The structured knowledge questionnaire consisted of two sections. Section 1 comprised 5 items for obtaining information about selected demographic factors such as age, sex, educational qualification, years of experience and in-service education and Section 2 comprised of 30 items to assess knowledge on standard precautions classified in four areas of hand washing, waste disposal, handling of needles syringes and sharps, and personal protective equipment. Total score for structured knowledge questionnaire Section 2 was 30. Observation checklist comprised 61 items on various aspects of standard precautions like hand washing, waste disposal, use of mask and gloves, handling of needles and syringes, etc. Each correct practice item carried one mark. Practices of nursing personnel were recorded on the observation check list.

Content validity of the tools was established by experts from the field of medical-surgical nursing. Reliability of structured knowledge questionnaire was established using Kuder-Richardson formula and it was found to be 0.74. Method of inter-observer reliability was used for establishing reliability for the observation checklist. There was 98% agreement. Formal administrative approval and ethical clearance was obtained from the administrative authority and ethical clearance committee of DDU Hospital, Hari Nagar. Data was collected from 19 December 2015 to 9 January 2016. Samples were selected using purposive sampling technique. Consent was taken from all the participants. The investigator personally met all the respondents who were selected for the study in the setting during the period of study and explained about the purpose of the study. The respondents were assured for maintaining confidentiality of their responses to obtain free and unbiased opinion. On day one, pretest on knowledge and practice was administered. On day two, a planned teaching program was conducted. It had contents on standard precautions on hand washing, waste disposal, handling of sharp instruments and linen and uses of personal protective equipment. A set of PowerPoint slides, mannequin and equipment were used. On day eight, posttest on knowledge and practice was administered. Data was analyzed using descriptive statistics.
Results

Table 1. Frequency and Percentage Distribution of Sample Characteristics according to Age, Sex, Education and In-service Education

| S. No. | Sample Characteristics | Frequency | Percentage (%) |
|--------|------------------------|-----------|----------------|
| 1.     | Age (in years)         |           |                |
|        | 20–30                  | 27        | 54             |
|        | 31–40                  | 08        | 16             |
|        | 41–50                  | 15        | 30             |
| 2.     | Sex                    |           |                |
|        | Male                   | 12        | 24             |
|        | Female                 | 38        | 76             |
| 3.     | Educational qualification |          |                |
|        | M.Sc. nursing          | 3         | 6              |
|        | B.Sc. nursing          | 4         | 8              |
|        | Post-basic B.Sc. nursing | 3      | 6              |
|        | General nursing         | 40        | 80             |
| 4.     | In-service education program attended on hospital-acquired infection | | |
|        | Yes                    | 40        | 80             |
|        | No                     | 10        | 20             |
| 5.     | No. of in-service education programs attended on HAI | | |
|        | Once                   | 24        | 48             |
|        | Twice                  | 09        | 18             |
|        | Thrice                 | 04        | 8              |
|        | More Then Thrice       | 03        | 6              |
|        | Not Attended           | 10        | 20             |

Data in Table 1 shows that more than half (54%) of nursing personnel were in the age group of 20–30 and 30% were in the age group of 41–50. Majority of the nursing personnel were female (76%) and 24% were male. Majority of nursing personnel were GNM (80%) and only few (6%) were M.Sc. nursing. Majority of nursing personnel had attended in-service education (80%) and 20% never attended any in-service education.

Table 2. Mean, Mean Difference, Standard Deviation Difference, Standard Error Mean Difference and “t” Value of Mean Pretest and Posttest Knowledge Scores

| Knowledge Scores | Mean (M) | M_0 | S.D_0 | S.E_0 | “t” Value |
|------------------|----------|-----|-------|-------|-----------|
| Pretest          | 15.5     | 12.4| 5.45  | 0.47  | 26.34     |
| Posttest         | 27.9     |     |       |       |           |

*Significant at 0.05 level of significance df (49), t=2.01

Data presented in Table 2 reveals that the mean pretest knowledge score (15.5) was lower than the post-test knowledge score (27.9). The mean difference was 12.4, which was found to be statistically significant as evident from the “t” value of 26.34 for degree of freedom (49) at 0.05 level of significance. This shows that the obtained mean difference in knowledge scores was the true difference and not by chance. This suggests that PTP was effective in increasing the knowledge of nursing personnel regarding standard Precautions.

Table 3. Mean, Mean Difference, Standard Deviation Difference, Standard Error Mean Difference and “t” Value of Mean Pretest and Posttest Practice Scores

| Practice Scores | Mean (M) | M_0 | S.D_0 | S.E_0 | “t” Value |
|-----------------|----------|-----|-------|-------|-----------|
| Pretest         | 20.1     | 39  | 35.52 | 1.19  | 32.77     |
| Posttest        | 59.1     |     |       |       |           |

*Significant at 0.05 level of significance df (49), t=2.01
Data in Table 3 reveals that the mean pretest practice score of (20.1) was lower than the posttest practice score (59.1). The mean difference was 39, which was found to be statistically significant as evident from the “t” value of 32.77 for degree of freedom (49) at 0.05 level of significance. This shows that the obtained mean difference in practice scores was the true difference and not by chance. This suggests that PTP was effective in increasing the practice of nursing personnel regarding standard precautions.

Discussion

The findings of the present study are consistent with the findings of a study conducted by Enein et al., who conducted a study to determine the degree to which standard precautions are applied by nurses in a dialysis unit in terms of hand hygiene and use of personal protective equipment. It revealed that less than half (47.1%) of nurses correctly knew that they had to wash their hands before and after caring for a patient. None of the nurses received training in infection control. 80% of nursing personnel had attended in-service education program in the present study, which is in contrast with the findings of the above study.

The findings of the present study are also consistent with the study findings of Labrague et al., who assessed knowledge and compliance of standard precautions among student nurses. The findings revealed that student nurses had knowledge deficit regarding standard precautions and that a 30-minute educational in-service program was effective in increasing the compliance with standard precautions and other risks of occupational transmission of these diseases.

The findings revealed that poor compliance with standard precautions was noted by healthcare workers. Findings are in conformity with the study findings of Gupta et al., who studied the knowledge, attitude and practice of healthcare workers regarding HIV, HBV and other risks of occupational transmission of these diseases. The findings revealed that healthcare workers had poor compliance with standard precautions.

Conclusion

In tertiary level government hospitals, due to heavy workload of patients, lack of teaching programs, and lack of preventive measures, nursing staff is at a higher risk of contracting hospital-acquired infections. It is necessary for health workers to follow rigid infection control practices. Standard precautions training should be strengthened and personal protection equipment should be provided. Teaching approaches must be geared towards intensifying the compliance with the use of PPE.

Conflict of Interest: None

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