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Evaluation of Knowledge, Attitude, and Practice Regarding Hand Hygiene Practices among Inpatients of Kalinga Institute of Medical Sciences Bhubaneswar: A Preliminary Study

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Abstract

Background:

Health-care-associated infection or nosocomial infection is defined as patients getting an infection on admission to the hospital if they were not infected or incubating the infection before admission. Hand hygiene is the most important measure that can avoid the transmission of germs and can prevent health-care-associated infections.

Materials and Methods:

A hospital-based cross-sectional study was conducted between June 2020 to July 2021 with the objective to evaluate knowledge, attitude, and practice of hand hygiene among the inpatients of Kalinga Institute of Medical Sciences, Bhubaneswar. A predesigned structured questionnaire was used for data collection. Knowledge and attitude of the participants were assessed using prevalidated 9 point and 6 point scale. Practice of the health-care providers (HCPs) toward health hygiene observed by the patients was also assessed using 6 point scale.

Results:

Majority of the participants had average knowledge score (56.7%) and average attitude score (62.0%) on hand hygiene, whereas their observation on the practice of hand hygiene among HCPs has given bad score (50.7%). Males have significantly good knowledge ($P = 0.0001$) and attitude score ($P = 0.00097$) compared to female. Similarly higher educational level participants had significantly good knowledge ($P = 0.0002$) and attitude score ($P = 0.0053$) on hand hygiene.

Conclusions:

The findings of this study indicate that there is insufficient hand hygiene awareness among the inpatients in a tertiary care hospital population mainly among the female and less educated participants. Hence, development of community-based hand hygiene promotion programs for the general public are the need of the hour.

KEYWORDS: *Attitudes and practices study, community based program, hand hygiene, hospital-acquired infection, knowledge, knowledge score*

INTRODUCTION

Health-care-associated infection (HAI) or nosocomial infection is defined as patients getting infections on admission to the hospital if they were not infected or incubating the infection before admission.[1] Seven patients out of every hundred patients admitted get HAI in developed countries compared to 10 in developing countries. Hands are the main pathways for spreading nosocomial infections.[2] The importance of hand hygiene in the prevention of health-care-associated infection (HAI) was initially emphasized in the 1840s by Oliver Wendell Holmes and Ignaz Semmelweis. Mortimer *et al.* established the importance of hand hygiene in preventing *Staphylococcus aureus* transmission in a neonatal unit.

Hand hygiene is the most important measure that can avoid the transmission of germs and can prevent health-care-associated infections.[3] Avoidance of hospital-acquired infections (HAI) has become an integral part of patient safety.[4] The World Alliance for Safer Health Care was formed in 2004 and later the "SAVE LIVES: Clean your Hands" campaign in 2009.[5] In spite of the robust evidence to support the benefits of hand hygiene to prevent HAI and development of proper guidelines, it has not been translated into adoption of the practice. Till now, the focus was on doctors and health-care professionals for the prevention of nosocomial infections. [6,7,8,9] However, there is no study done on patients in India to provide evidence regarding the knowledge, attitude, and practice of hand hygiene practice. Hence, this study was undertaken in the inpatients of a tertiary care teaching hospital, Kalinga Institute of Medical Sciences (KIMS), Bhubaneswar, India.

Objectives

The objective was to evaluate knowledge, attitude, and practice of hand hygiene practice among the inpatients of KIMS, Bhubaneswar.

Study design and setting

A cross-sectional study was conducted among inpatients admitted to different wards of KIMS, Bhubaneswar, from June 2020 to July 2021. KIMS, Bhubaneswar, is a tertiary care teaching hospital located in the capital city of Odisha. Approval of the Institutional Ethics Committee was taken. The study was registered with the Clinical Trial Registry of India (CTRI/2020/05/025066). The study was conducted according to the Declaration of Helsinki and followed the ICH-GCP protocol. Written informed consent was obtained from all the participants willing to participate in the study before starting any study procedure.

Participants recruitment

We included all adult patients over 18 years of age admitted in the hospital and giving written informed consent to participate in the study. We excluded patients who are unable to realize the hand hygiene concept, e.g. due to lack of understanding, and not willing to follow the study procedure. Patients with mental confusion or advanced dementia and patients with depression or schizophrenia were also excluded. A study conducted by Mohamed *et al.* in Malaysia had found that the mean knowledge score of parents of preschool children about hand hygiene was 2.72 (SD 0.26).^[10] Using the formula $N = (Z\sigma/E)^2$, considering 95% confidence interval ($Z = 1.96$), relative error = 5%, standard deviation (σ) = 0.26, and nonresponse rate 20%, the total sample size derived was 123. Rounded up sample size was 150. Participants were selected using the convenience sampling method.

Data collection

Data collection was questionnaire based. Questionnaire had two parts. Part 1: Demographic characteristics of the participants and Part 2: Questions related to knowledge (9 items) and attitude (6 items) of the participants toward hand hygiene in hospital setting and patient's observation of practice of hand hygiene among the health-care providers (HCPs) (6 items). Knowledge and practice section had three options: Yes/No/Don't know. Similarly, attitude section had 5 options in Likert scale (strongly agree to strongly disagree). Pretesting of the questionnaire was done to check the reliability and reliability coefficient (Cronbach's alpha) value was 0.71. A scoring mechanism for each section was developed by the researcher with the help of experts in biostatistics. Knowledge question had the following scoring system: correct answer (Yes) = 1 and wrong answer (No/Don't know) = 0. Hence, the maximum attainable score in knowledge section was 9 and minimum was 0. Similarly, attitude section 1 was given to "strongly disagree" and strongly agree 5. Hence, maximum attainable score was 30 and minimum was 6. In observation of practice-related question, the scoring system was correct answer (Yes) = 1 and wrong answer (No/don't know) = 0. Hence, the maximum attainable score in knowledge section was 6 and minimum was 0. Knowledge score was divided into three groups: good (6–9), average (4–6), and bad (0–3). Similarly, attitude was divided into positive attitude (score 23–30), average (score 15–22), and negative (score 6–13).

The data collected from the participants were entered into case record forms and all the data were compiled in a Microsoft Excel sheet by two independent research assistants.

Statistical analysis

Descriptive statistics was used for analysis of the data. Inferential methods such as Chi-square method were applied and reported when significant and decisive results were found.

RESULTS

Demographic data in [Table 1](#) show that majority of the participants are from 40 to 60 years age group, male by gender (68.7%), education between secondary school and graduate (30%), unemployed (28.0%) or housewife (28.0%) by occupation, Hindu (82.0%) by religion, and belong from lower middle-class family (37.3%).

[Table 2](#) shows that majority (54.0%) of the participants know that “proper hand washing can prevent infectious disease” followed by “which one is better option washing or disinfecting your hand” –30%, whereas knowledge of the participants about “signs of infection” was very less (don't know 74.0%); similarly, “what proportion of health care providers are following hand hygiene method properly” was also very limited (71.3% don't know).

[Table 3](#) shows that participants had a full agreement with the statement that “a person should wash hand before eating” (strongly agree 82.0%). Similarly, 47.3% (strongly agree) had the opinion that “Health care providers should wash hand every time after they examine a patient”.

[Table 4](#) shows the observation of the patients about the hand hygiene practice of the HCPs. Majority of the participants (80.7%) had the observation that they had not seen/don't know that “health care provider follow the proper 7 steps of hand washing”. Similarly, Majority (56%) of the participants told that yes HCPs often forget to wash their hands.

[Table 5](#) shows majority of the participants had average knowledge score (56.7%) and average attitude score (62.0%) on hand hygiene, whereas their observation on the practice of hand hygiene among HCPs has given bad score (50.7%) in majority.

[Table 6](#) shows that males have significantly good knowledge ($P = 0.0001$) and attitude score ($P = 0.00097$) compared to females in the scoring system of knowledge and attitude toward hand hygiene. However, observation on the practice of the hand hygiene of the HCPs shows that male patients has given significantly ($P = 0.0001$) bad score (92.1%) to the HCPs. Similarly, higher educational level participants had significantly good knowledge ($P = 0.0002$) and attitude score ($P = 0.0053$) on hand hygiene, but observation on the practice of the hand hygiene of the HCPs shows that higher educated patients has given significantly ($P = 0.0012$) bad score (63.1%) to the HCPs.

DISCUSSION

The present study attempted to assess the knowledge, attitude, and practice regarding hand hygiene among the patients admitted to a tertiary care teaching hospital. The study also tried to determine an association with the sociodemographic features of the participants. The results of our study indicate that majority of our participants are >40 years of age and had minimum high school level education. Although most participants (54.6%) had knowledge that

proper hand hygiene can prevent infections, they did not know the signs of infection (74%). Most of the participants could not say what percent of HCP were following the proper hand hygiene practice. Nevertheless, majority (82%) strongly agree that a person should wash their hands before eating. Similarly, most of the participants opined that HCP should wash their hands before examining a patient.

Majority of the participants said they had not seen or they did not know that the HCP was following the 7 steps of handwashing and HCP often forgets to wash their hands. The results of our study are in sync with previous studies.[11,12] Male participants had significantly good knowledge and attitude scores as compared to the females regarding hand hygiene practice. It was also seen that the male participants gave a bad score to HCPS regarding their hand hygiene practice. The study also revealed that participants in the higher income group had better knowledge and attitude regarding hand hygiene than the lower income group. This may be likely due to their better awareness and ability to afford soaps and disinfectants.[13]

CONCLUSIONS

The findings of this study may indicate that there is insufficient hand hygiene awareness among the inpatients in a tertiary care hospital population. The results of the study indicate a need for an extensive public health education program on the topic. The study shows the need for further improvement in the existing hand hygiene behavioral change communication programs to address the gaps in knowledge, attitudes, and practices. Furthermore, multifaceted and dedicated efforts must be undertaken to rectify this attitude and behavior from early on. [14] Therefore, community-based public health education programs and development of hand hygiene promotion programs for the general public based on the findings of this study are recommended.

Limitations

The study was restricted to the inpatients admitted to a tertiary care teaching hospital in capital city of state of Odisha. It does not reflect the Indian population as a whole and also does not represent all the population of state of Odisha. Future multicentric nationwide research is needed to get more data.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Figures and Tables

Table 1

Demographic characteristics of the participants ($n=150$)

| Variable | <i>n</i> (%) |
|------------------------|---------------------|
| Age (years) | |
| 18-40 | 33 (22) |
| 40-60 | 70 (46.7) |
| >60 | 47 (31.3) |
| Gender | |
| Male | 103 (68.7) |
| Female | 47 (31.3) |
| Education | |
| Illiterate | 30 (20) |
| Up to primary school | 23 (15.3) |
| Up to secondary School | 39 (26) |
| Up to graduate | 45 (30.0) |
| Postgraduate and above | 13 (8.7) |
| Occupation | |
| Unemployed | 42 (28.0) |
| Housewife | 42 (28.0) |
| Jobs | 21 (14.0) |
| Agriculture | 34 (22.7) |
| Others | 11 (7.3) |
| Religion | |
| Hindu | 123 (82.0) |
| Muslim | 27 (18.0) |
| Others | Nil |
| Income | |
| Upper class (I) | 15 (10.0) |
| Upper middle (II) | 23 (15.3) |
| Middle class (III) | 34 (22.7) |
| Lower middle (IV) | 56 (37.3) |
| Lower class (V) | 22 (14.7) |

Table 2Response rate of knowledge-based questions (*n*=150)

| Question | Yes, <i>n</i> (%) | No, <i>n</i> (%) | Don't know, <i>n</i> (%) |
|---|------------------------------|-----------------------------|-------------------------------------|
| Do you know about health-care-associated infections? | 15 (10.0) | 89 (59.3) | 46 (30.7) |
| Bacteria can spread through unclean hand from one person to another? | 97 (64.7) | 7 (4.7) | 46 (30.6) |
| Do you know the correct technique of handwashing has 5 steps | 20 (13.3) | 26 (17.3) | 104 (69.3) |
| Do you know proper handwashing can prevent infectious disease? | 81 (54.0) | 31 (20.7) | 38 (25.3) |
| Do you know the signs of infection? | 21 (14.0) | 18 (12.0) | 111 (74.0) |
| Do you know which one is better, washing or disinfecting your hand? | 45 (30.0) | 23 (15.3) | 82 (54.7) |
| Do you know how important is hand hygiene for patients and health-care workers? | 13 (8.7) | 67 (44.7) | 70 (46.6) |
| Do you know how long does it take to cleanse one's hands? | 18 (12.0) | 79 (52.7) | 53 (35.3) |
| Do you know what proportions of health-care workers are following hand hygiene methods properly | 34 (22.7) | 9 (6.0) | 107 (71.3) |

Table 3Response rate of attitude-based question (*n*=150)

| Question | Strongly disagree, <i>n</i> (%) | Disagree, <i>n</i> (%) | Not sure, <i>n</i> (%) | Agree, <i>n</i> (%) | Strongly agree, <i>n</i> (%) |
|--|--|-----------------------------------|-----------------------------------|--------------------------------|---|
| Health-care providers should wash hand every time after they examine a patient | 5 (3.33) | 12 (8.0) | 28 (18.7) | 34 (22.7) | 71 (47.3) |
| Wearing a gloves is substitute to hand cleaning | 18 (12.0) | 21 (14.0) | 32 (21.3) | 65 (43.3) | 14 (9.3) |
| Washing with antimicrobial soap is better than washing with alcoholic hand rub | 51 (34.0) | 45 (30.0) | 14 (9.3) | 26 (17.3) | 14 (9.3) |
| A person should wash hand before eating | 8 (5.3) | 7 (4.7) | 7 (4.7) | 5 (3.3) | 123 (82.0) |
| Health care providers should train all the patients about hand hygiene | 15 (10.0) | 21 (14.0) | 45 (30.0) | 59 (39.3) | 10 (6.7) |
| Hand hygiene technique is taught to all the health-care providers | 8 (5.3) | 16 (10.7) | 89 (59.3) | 19 (12.7) | 18 (12.0) |

Table 4

Observation of the patients about practice of hand hygiene by the health-care providers

| Question | Yes, n (%) | No, n (%) | Don't know, n (%) |
|--|-------------------|------------------|--------------------------|
| Do you think health-care providers wash their hands before wearing the gloves? | 15 (10.0) | 89 (59.3) | 116 (77.3) |
| Does the health-care provider feel irritated by washing his/her hands again and again? | 34 (22.7) | 40 (26.7) | 76 (50.7) |
| Do the health-care provider often forget to wash their hands | 85 (56.7) | 21 (14.0) | 44 (29.3) |
| Does the health-care provider follow the proper 7 steps of handwashing? | 8 (5.3) | 21 (14.0) | 121 (80.7) |
| Does the health-care provider maintain hand hygiene before and after physically handling the patients? | 17 (11.3) | 91 (60.7) | 42 (28.0) |
| Does the health-care provider maintain hand hygiene only before physically handling the patients? | 45 (30.0) | 49 (32.7) | 56 (37.3) |

Table 5

Categorization of the patients' knowledge, attitude, and observed practice score

| Variable | Good (7-9), n (%) | Average (4-7), n (%) | Bad (0-3), n (%) |
|---|--------------------------------|-------------------------------|-------------------------------|
| Knowledge score | 17 (11.3) | 85 (56.7) | 48 (32.0) |
| Variable | Good (5-6), n (%) | Average (3-4), n (%) | Bad (0-2), n (%) |
| Observation hand hygiene practice score | 25 (16.7) | 49 (32.7) | 76 (50.7) |
| Variable | Positive (23-30), n (%) | Average (15-22), n (%) | Negative (6-13), n (%) |
| Attitude | 38 (25.3) | 93 (62.0) | 19 (12.7) |

Table 6

Association of knowledge, attitude, and practice score with gender and education

| Variable | Good, n (%) | Average, n (%) | Bad, n (%) | χ^2 | <i>P</i> |
|-------------------------|--------------------|-----------------------|-------------------|----------|----------|
| Knowledge score | | | | | |
| Male | 13 (76.5) | 70 (82.3) | 20 (41.7) | 24.149 | 0.0001 |
| Female | 4 (23.5) | 15 (17.7) | 28 (58.3) | | |
| Attitude score | | | | | |
| Male | 27 (71.1) | 71 (76.3) | 5 (26.3) | 18.487 | 0.00097 |
| Female | 11 (28.9) | 22 (23.7) | 14 (73.7) | | |
| Observed practice score | | | | | |
| Male | 13 (52.0) | 20 (40.8) | 70 (92.1) | 40.2977 | 0.00001 |
| Female | 12 (48.0) | 29 (59.2) | 6 (7.9) | | |
| Knowledge score | | | | | |
| Up to primary | 5 (41.7) | 20 (23.5) | 28 (58.3) | 16.557 | 0.0002 |
| Above primary | 12 (58.3) | 65 (76.5) | 20 (41.7) | | |
| Attitude score | | | | | |
| Up to primary | 12 (31.6) | 28 (30.1) | 13 (68.4) | 10.449 | 0.0053 |
| Above primary | 26 (68.4) | 65 (69.9) | 6 (31.6) | | |
| Observed practice score | | | | | |
| Up to primary | 18 (47.4) | 23 (24.7) | 12 (63.1) | 13.422 | 0.0012 |
| Above primary | 20 (52.6) | 70 (75.3) | 7 (36.8) | | |