Research Article

Hand hygiene practices among nursing students: importance of improving current training programs

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ABSTRACT

Background: Although numerous studies have demonstrated that hand hygiene reduces health care–associated infection rates, adherence to hand hygiene guidelines remains uniformly low among health care workers. The present study was undertaken to assess the hand hygiene practices among the nursing students of Bareilly and to suggest the suitable corrective and preventive measures to be taken in future.

Methods: These six months cross sectional study was carried out among the nursing students of Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh, India. A total of 50 students participated in the study. A structured, self-administered pretested questionnaire was used to collect detailed information about the subjects’ self-reported hand washing practices. Knowledge was assessed using 25 questions which included multiple choice and “yes” or “no” questions. A scoring system was used where 1 point was given for each correct response to knowledge, positive attitudes and practices and 0 was given for incorrect knowledge, negative attitudes, and poor practices. Data entry and statistical analysis were performed using the Microsoft Excel and SPSS windows version 14.0 software.

Results: Majority of the healthcare workers were females (72.0%), were aged between 31-40 years (60.0%) and had received formal training in hand hygiene in the last 3 years (90.0%). A higher proportion of them routinely used alcohol based hand rub (52.0%). Nearly 28% had poor knowledge and 72% had moderate knowledge regarding hand hygiene.

Conclusions: The knowledge about good hand washing practices and compliance of the same according to WHO guidelines amongst health care workers is essential for lowering the health care associated infections. Our study shows the importance of improving the current training programs targeting hand hygiene practices among nursing students.

Keywords: Hand hygiene, Nursing students, Training program

INTRODUCTION

The practice of hand hygiene by health care workers, through the use of either soap and water or an alcohol-based hand sanitizer, is widely considered to be the most important and effective means of preventing health care–associated infections. Although numerous studies have demonstrated that hand hygiene reduces health care-associated infection rates, adherence to hand hygiene guidelines remains uniformly low among health care workers. According to WHO, the prevalence of these nosocomial infections, is as high as 19%, in developing countries posing a challenge to health care providers. Proper training and basic awareness about hand washing guidelines among the hospital personnel is required to reduce this burden of nosocomial infections. With this background, the present study was undertaken to assess the hand hygiene practices among the nursing students of...
Rohilkhand Medical College and Hospital, Bareilly and to suggest the suitable corrective and preventive measures to be taken in future.

METHODS

These six months (January –June 2012) cross sectional study was carried out among the nursing students of Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh, India. The approval for this study was obtained from the institutional ethical committee and the consent of all the students was taken. All the nursing students who were present in the respective departments were surveyed and they comprised the study unit. A total of 50 students participated in the study. A structured, self-administered pretested questionnaire was used to collect detailed information about the subjects’ self-reported hand washing practices. Information was collected on the basis of the Hand Hygiene Knowledge Questionnaires for Health-Care Workers designed by WHO and revised August 2009, which was further modified and this included questions carrying both multiple choice and “yes” or “no” questions. The students were assured confidentiality of their responses.

Knowledge was assessed using 25 questions which included multiple choice and “yes” or “no” questions. A scoring system was used where 1 point was given for each correct response to knowledge, positive attitudes and practices and 0 was given for incorrect knowledge, negative attitudes, and poor practices. On the basis of this formula score%=(total correct responses/25)* 100, a score of more than 75% was considered good, 50-74% moderate and less than 50% poor.

The suitable corrective and preventive measures to be taken for the study population were suggested. Data entry and statistical analysis were performed using the Microsoft Excel and SPSS windows version 14.0 software.

RESULTS

Majority of the healthcare workers were females (72.0%), were aged between 31-40 years (60.0%) and had received formal training in hand hygiene in the last 3 years (90.0%). A higher proportion of them routinely used alcohol based hand rub (52.0%) (Table 1).

Majority (76.0%) correctly opined that the unclean hands of health care worker were the main route of cross-transmission of potentially harmful germs between patients in a health care facility. The most frequent source of germs responsible for health care-associated infections was hospital’s air (70.0%) (Table 2).

| Variable | Frequency |
|----------|-----------|
| Gender   |           |
| Male     | 14 (28.0) |
| Female   | 36 (72.0) |
| Age Group|           |
| 18 - 30  | 20 (40.0) |
| 31 - 40  | 30 (60.0) |
| Departments |       |
| Emergency| 3 (6.0)   |
| ENT      | 5 (10.0)  |
| Opthal   | 5 (10.0)  |
| Medicine | 4 (8.0)   |
| Surgery  | 10 (20.0) |
| ICU      | 9 (18.0)  |
| Gynae    | 6 (12.0)  |
| Chest & TB| 5 (10.0) |
| Ortho    | 3 (6.0)   |
| Received Formal Training in hand hygiene in last years | |
| Yes      | 45 (90.0) |
| No       | 5 (10.0)  |
| Routinely use alcohol based hand rub | |
| Yes      | 26 (52.0) |
| No       | 24 (48.0) |

| Opinion about Infections | Frequency (Yes) |
|--------------------------|-----------------|
| Main route of cross-transmission of potentially harmful germs between patients in a health care facility | |
| Health care worker hands not clean | 38 (76.0) |
| Exposure to colonized surfaces | 11 (22.0) |
| Sharing non-invasive objects | 1 (2.0) |
| Source of germs responsible for health care-associated infections | |
| Hospital's Water System | 2 (4.0) |
| Hospital's air | 35 (70.0) |
| Hospital's Environment (surfaces) | 13 (26.0) |
Majority (90.0%) thought no hand hygiene method is required before palpation of the abdomen (72.0%) and before giving an injection (70.0%). A higher proportion of them thought rubbing is required after emptying a bedpan (58.0%). All of them said washing was required after removing examination gloves (100.0%). A higher proportion of them thought rubbing is required after making a patient's bed (52.0%) while washing is required after visible exposure to blood (62.0%) (Table 4).

Majority (90.0%) correctly thought that touching damaged skin should be avoided, as associated with increased likelihood of colonisation of hands with harmful germs (Table 5).

Table 5: Associated with increased likelihood of colonisation of hands with harmful germs.

| Property                     | Frequency (Yes) | % |
|------------------------------|-----------------|---|
| Wearing jewelry              | 33              | 66.0 |
| Damaged skin                 | 45              | 90.0 |
| Artificial fingernails       | 19              | 38.0 |
| Regular use of a hand cream  | 21              | 42.0 |

Nearly 28% had poor knowledge and 72% had moderate knowledge.

Table 6: Associated with increased likelihood of colonisation of hands with harmful germs.

| Knowledge about hand hygiene | Frequency (Yes) | Percent |
|------------------------------|-----------------|---------|
| Poor                         | 14              | 28.0    |
| Moderate                     | 36              | 72.0    |
| Total                        | 50              | 100.0   |
DISCUSSION

Hand hygiene is most often associated with hand washing in the health care field. A health care provider can wash their hands with anti-microbial soap or an alcohol based hand sanitizer. Majority (90.0%) of the healthcare workers had received formal training in hand hygiene in the last 3 years in this study. Training sessions regarding hand hygiene practices among the health care workers are required to provide the correct knowledge in the area of nosocomial infections and prevention of infections. A higher proportion of respondents routinely used alcohol based hand rub (52.0%) in this study. Similar findings were reported by Maheshwari et al. (2014) among staff nurses in a tertiary care hospital in Bhopal. Majority (76.0%) correctly opined that the unclean hands of health care worker were the main route of cross-transmission of potentially harmful germs between patients in a health care facility. Our finding is in agreement to the study by Nair et al (2014) among nursing students of tertiary medical college at Raichur. In this study the most frequent source of germs responsible for health care associated infections was hospital’s air (70.0%). However germs already present on or within the patient was the most frequent source perceived in other studies.3,4 Majority (96.0%) opined that hand hygiene actions immediately after a risk of body fluid exposure prevents transmission of germs to the patient. Similar findings were reported in previous studies.3,4 All the students opined that hand hygiene actions after exposure to the immediate surroundings of a patient prevents transmission of germs to the health care worker. However only one third of nursing students at the University of Sri Jayewardenepura opined that hand hygiene actions after exposure to the immediate surrounding prevents transmission of germs to the health care worker.5 Majority opined hand hygiene actions after touching a patient prevents transmission of germs to the health care worker. This is in agreement to the findings observed by other studies.3,4 All mentioned that hand rubbing (using alcohol based hand rub) is more rapid for hand cleansing than handwashing with soap and water. Similar observations have been observed by other studies.3,5 Majority (72.0%) said minimal time needed for alcohol-based handrub to kill most germs was 20 seconds. Poor awareness regarding minimal needed for alcohol based handrub to kill most germs was 20 seconds. Poor awareness regarding minimal needed for alcohol based handrub to kill most germs (20 seconds) was reported by previous studies.3,4 Our findings were similar to a study carried out by AbdElaziz et al. in Cairo wherein a quarter of respondents showed inappropriate hand washing due to both short contact time (less than 30 sec).7 Bargellini et al.8 reported hand hygiene practices and knowledge were significantly higher in nursing compared to medical students in Italy. The most effective procedure in reducing bacterial contamination was the alternate use of hand washing and hand rubbing compared to only one practice and the absence of hand hygiene (p<0.001).

Majority thought no hand hygiene method is required before palpation of the abdomen (72.0%) and before giving an injection (70.0%) in this study. This is in contrast to the study findings reported by Maheshwari et al. where about one third of respondents thought rubbing was required before palpation of abdomen and before giving an injection.3 A higher proportion of students thought rubbing is required after emptying a bedpan (58.0%) in our study. Dissimilar findings were reported by the previous studies3,6 where majority thought washing was required after emptying a bedpan. All of the respondents said washing was required after removing examination gloves (100.0%). Similar findings have been reported by other studies.3,6 About half of the nursing students thought rubbing is required after making a patient’s bed in our study. Lower percentage of respondents thought rubbing is required after making a patient’s bed in the study by Maheshwari et al. (12.6%) and Ariyaratne et al. (12.9%).5 A higher proportion (62.0%) of respondents thought washing is required after visible exposure to blood in this study. Similar findings have been reported by the previous studies.3,6 Nearly two thirds opined that wearing jewelry should be avoided, as associated with increased likelihood of colonization of hands with harmful germs. Higher percentage of respondents (nearly 96.0%) thought wearing jewelry should be avoided in the studies conducted in Bhopal, Raichur, Srilanka and Karad.3,4 Majority (90.0%) correctly thought that touching damaged skin should be avoided, as associated with increased likelihood of colonisation of hands with harmful germs. Similar findings have been reported by the other studies.3,6 Only about one third thought artificial fingernails was associated with increased likelihood of colonisation of hands with harmful germs. Higher percentage of respondents thought artificial fingernails was associated with increased likelihood of colonization of hands with harmful germs in Srilanka7 (90.3%) and Karad8 (90.0%).

A study done by Sande et al.9 showed growth in 107 (71.3%) out of total 150 samples collected before hand washing among nursing staff in a tertiary hospital. Apart from skin commensals, Staphylococcus aureus, Enterococcus faecalis, Klebsiella pneumoniae, E.coli and Pseudomonas aeruginosa were detected. Methicillin Resistant Staphylococcus aureus strains were also isolated from hand swabs collected before hand washing. Growth was observed in only 22 (14.7%) samples after hand washing. In another study by Carradine et al.,10 only 37% of nursing students self reported to wash their hands 100% of the time during clinical rotation.

KuKanich et al.1 conducted a study in two outpatient health care clinics. The frequency of hand hygiene was poor at baseline (11% and 21%) but improved significantly after intervention (36% and 54%) and was maintained through the follow-up period (32% and 51%). Throughout the study, post-contact hand hygiene was observed significantly more than pre-contact hand hygiene.
The majority of the Malaysian medical science students mentioned that they frequently washed their hands using soap while some of the participants washed the hands only with plain water. Laziness was their main barrier of frequent hand washing, followed by lack of nearby water supply and then the feeling that their hands are not dirty enough to be infected. An overuse of gloves and underuse of gel was demonstrated among final year nursing students and infection prevention and control nurses by Lee et al (2013). In another study by Barrett et al. amongst nursing students, hand hygiene compliance was perceived to be effected by specific barriers which included: time and busyness; clinical procedure; skin condition; lack of knowledge and glove use. In another study by Kumar et al (2013), health care workers perceived that high workload, shortage of time & not enough sinks are some important barriers for practicing hand washing. Akyol et al. in their study revealed that nurses in Turkey had a poor level of knowledge concerning quality of hand washing and were not able to wash their hands often because of dense working conditions, insufficiency of necessary materials and drying and sore of hands after frequent washing.

Nearly 28% had poor knowledge and 72% had moderate knowledge about hand hygiene in our study. The knowledge on hand hygiene was moderate (144 out of 200, 74%) among 100 nursing staff and 100 nursing students in a tertiary medical college in Karad. Knowledge was ‘good’ about hand washing (75.5%) among nursing students in Mangalore as reported by Chacko et al. Participants had moderate knowledge (77%) but attitudes, practices and satisfaction of facilities of all the participants was overall poor (<50%) in the study conducted in Sri Lanka.

Although majority had received formal training in hand hygiene in the last 3 years still none had good knowledge. The knowledge about good hand washing practices and compliance of the same according to WHO guidelines amongst health care workers is essential for lowering the health care associated infections. Our study shows the importance of improving the current training programs targeting hand hygiene practices among nursing students. Hand hygiene training sessions may need to be conducted more frequently for students with continuous monitoring and performance feedback to encourage them to follow correct hand hygiene practices.

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