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RESEARCH ARTICLE

KNOWLEDGE OF HANDWASHING AMONG THE MEDICAL AND NURSING PROFESSIONALS OF A TERTIARY CARE TEACHING HOSPITAL IN SOUTH GUJARAT, INDIA AFTER COVID – 19 PANDEMIC: A CROSS-SECTIONAL STUDY

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Abstract

Background: Overall, many patients get affected by Hospital Associated Infection (HAIs) every year. Hand hygiene (HH) has been distinguished as the absolute most significant component in preventing HAIs. The point of this study was to decide the knowledge in regards to hand cleanliness among health care personnel, and recognizing the loopholes in their insight.

Objective: This study aims to explore knowledge regarding hand hygiene among health care personnel.

Methodology: This is a cross sectional study in Surat among 174 medical and paramedical participants selected from New Civil Hospital by Purposive Sampling. Data collection was done by digital form asking to fill up the WHO hand hygiene questionnaire for health care workers during the month of August – September, 2022. Univariate analysis was done followed by Chi square test to establish associations.

Results: Mean age of population was 24.9±5.6 years. Knowledge score was classified into good (≥75%), moderate (50–75%) and poor (<50%). Majority of them had moderate knowledge (62.2%). The routine use of alcohol was significantly associated with receiving formal training in last 3 years ($\chi^2:15.890$, DF=1, p=0.000).

Conclusion: Despite training, paramedical staff have just moderate comprehension of hand hygiene, although medical students, on the contrary, have great grasp.

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Introduction:-

The practice of handwashing is one of the most important factors of infection control in a hospital setting. Healthcare workers, be it medical or nursing staffs, everyone is involved in the spread of infection from one patient to another through contaminated hands. ⁽¹⁾ The inadequate and improper hand hygiene by health care personnel accounts for 40% of the nosocomial infections. ⁽²⁾ The main reason for this poor hand hygiene practice is inadequate knowledge and inability to identify hand hygiene opportunities before, during and after patient care. Despite the

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formulation of many health hygiene guidelines by different countries, the overall compliance to handwashing and hand hygiene is poor.^(3,4) The World Health Organization (WHO) had issued guidelines regarding specific steps and procedures to be followed during hand washing back in the year 2005.⁽⁵⁾ A study among medical and nursing students of Puducherry concluded that the overall knowledge of handwashing among medical and nursing students are moderate; not satisfactory attitude and only a few have good practice.⁽⁶⁾ In another study among medical students of Western Saudi Arabia, only 56.1% had correct knowledge regarding hand hygiene.⁽⁷⁾ The training sessions have been conducted by the hospital authorities regarding the knowledge and correct technique of handwashing and infection control among the medical and paramedical personnel of New Civil Hospital, Surat after the detection of first case of COVID-19 in the hospital. Even before the start of 2nd wave of COVID-19, the healthcare workers were trained for the correct technique of hand hygiene protocols. Similarly, the hospital infection control committee had a prompt response for managing in the 3rd wave of COVID-19 by conducting refresher trainings of hand hygiene and correct use of personal protective equipment (PPE). Since, there have been repeated trainings of the medical and para medical staff, it gives an idea that they have adequate knowledge regarding the same. In view of the current scenario, where the world is in verge of another impending 4th COVID-19 wave due to gradual increase in number of COVID-19 cases, this study becomes important and will help in assessing the knowledge retained by the healthcare workers. Thus, the following study was carried out with the below mentioned objectives:

Objectives:-

1. To document the knowledge of hand hygiene among the medical and nursing staff.
2. To document any difference of knowledge of handwashing among the medical and nursing students.

Materials and Methods:-

A cross sectional study was conducted among 172 participants (chosen by purposive sampling) in New Civil Hospital, Surat (chosen by purposive sampling). Medical and para medical students and Health care personnel were recruited in the study. There were 27 medical postgraduate students, 30 medical interns, 52 medical undergraduate students, 37 staff nurse and 26 nursing students as the participants in this study. This study was conducted during August – September 2022. A structured questionnaire was filed in digital format consisting of standard WHO Questionnaire on Knowledge of Hand Hygiene⁽⁸⁾ by Google form after proper explanation of the study to the participants in a language they can understand and consent form was signed. This questionnaire consisted of assessing their knowledge regarding cross transmission of germs in health care facility between healthcare workers, between patients, healthcare associated infections, regarding various hand hygiene methods to be used in different situations in a healthcare setting and finally their knowledge regarding the things to be avoided to reduce colonization of hands with harmful germs.

Sample Size:

The prevalence of good handwashing knowledge was observed to be 12.2% based on the study done among medical and nursing students in K. J. Somaiya Medical College and Hospital, Mumbai, Maharashtra (India).⁽⁹⁾ Based on this prevalence the sample size was drawn using the formula $4 * (p) * (q) / L^2$ with 5% allowable error and 95% confidence level. Taking prevalence (p)=0.122, (q)= (1 – p) = 0.878. The sample size = $4 * 0.122 * 0.878 / 0.05^2 = 171.38$ (rounded off to ~172). Thus, the final sample size is 172.

Study Setting:

This study was done at New Civil Hospital, Surat and Government Nursing College, Surat; which were chosen purposively. At these sites' participants were recruited for the study by purposive sampling.

Sampling Process:

1. The medical students and interns were approached by contacting their respective class representatives and called for a meeting. The students were then given a briefing about the research and presented with a google form asking them to fill up.
2. Similarly, the permission was obtained from the Principal of the nursing college. The nursing students were given a briefing about the questionnaire and google forms were distributed.
3. The medical / nursing staff were approached individually and whosoever gave consent was given the choice to fill the questionnaire.
4. Around 200 google forms were sent to the medical and nursing students and 179 were received. Among them, 5 forms were incomplete, hence discarded. A total of 174 complete forms were obtained.

Study Tool:

A structured questionnaire was used to collect data. It was prepared by researchers after thorough review of literature. The questionnaire was divided into two parts assessing “sociodemographic characters”, “WHO hand hygiene questionnaire for health care workers”. This is a tool that has been developed based on the recommendations and evidences as outlined within the WHO Guidelines on Hand Hygiene in Health Care (2009).⁽⁸⁾ The tool had a total of 15 questions pertaining to different domains of hand washing. The scale had a high internal consistency with a Cronbach alpha of 0.8.⁽¹⁰⁾

Each correct answers were given one point whereas incorrect answers scored zero. The maximum score achievable for knowledge was 15 points. The level of knowledge was calculated by dividing the responses into three groups based on a score of more than 75% considered as good, 50-74% moderate, and less than 50% considered as poor.

Data collection and Analysis:

Informed written consent were obtained from the participants and they were allowed to leave the interview midway if they felt uncomfortable. Data collection was done by digital form (google form) using a pretested structured questionnaire. Data was extracted in Microsoft Excel from Google form. Data analysis was done in SPSS 26 for Windows (IBM Corp. Chicago, U.S). Univariate analysis was done including descriptive statistics of mean, standard deviation, frequencies and percentages. Bivariate analysis was done by Chi-square test. Arbitrarily, $p < 0.05$ was considered to be statistically significant. Privacy was maintained by interviewing in a secluded place and confidentiality was ensured by not taking identifiers (names, complete address) and presenting cumulative data.

Results:-

The total number of participants in our study was 172. The background characteristics of the participants reveals that the most of the participants in our study were the medical students, 52 (30.2%) followed by nurses, 37 (21.5%), then medical interns, 30 (17.4%), then medical residents, 27 (15.7%) and the last among the participants were nursing students, 26 (15.1%). The mean age of the study participants was 24.9 ± 5.6 years (Range:18-50 years). More than three-fourth, 134 (77.9%) of the participants had received formal training in hand hygiene in last three years. Similarly, more than three-fourth, 132 (76.7%) of the participants routinely use hand-rub for hand hygiene. (Table 1)

Knowledge on Hand hygiene among health care professionals:

The knowledge regarding the hand hygiene among the medical and nursing professionals found that 89 (51.7%) of the participants thought that the main route of cross-transmission of germs between patients were due to unclean hands of the healthcare workers. Approximately one fourth, 42 (24.4%) of the participants reported that germs already present on or within the patient are the main source of germs responsible for healthcare-associated infections. More than half, 122 (70.2%) of the participants shared that hand hygiene action prevents transmission of germs before touching a patient whereas as low as 17 (10%) shared that hand hygiene after exposure to immediate surroundings of the patient is a method of preventing germ transmission to the patients. Overall 105 (61%) of the participants shared one or the other correct responses in preventing germs transmission to the healthcare workers. More than half, 116 (67.4%) of the participants had correctly told that rubbing is to be done before palpation of the abdomen. Similarly, rubbing of the hands should be done before giving injection was correctly mentioned by 111 (64.5%) participants. Less than a quarter of the students, 40 (23.3%) revealed that rubbing of the hands is to be done after emptying a bedpan. More than three fourth, 130 (75.6%) participants had agreed that washing of hands is required after emptying a bed pan. Only 61 (35.5%) participants correctly mentioned of rubbing of hands after removal of gloves. More than half of them, 107 (62.2%) had wrongly mentioned that a hand washing is needed after removal of gloves. Similarly, the correct response of the requirement of hand rubbing after making patient's bed was mentioned by only 57 (33.1%) participants. Here also, majority of the participants, 109 (63.4%) wrongly mentioned the requirement of hand washing as the method of choice. In our study findings, 142 (82.6%) participants agreed of handwashing as the method of choice for visible post exposure to blood. Majority of the participants, 119 (69.2%), said that damaged skin is associated with increased likelihood of colonization of hands with harmful germs. Only 68 (39.5%) participants considered artificial fingernails to be associated with increased likelihood of colonization of hands with harmful germs. (Table 2)

Overall, majority of the participants 107 (62.2%) had moderate knowledge regarding hand hygiene. A total of 61 (35.5%) participants had poor knowledge regarding hand hygiene whereas only 4 (2.3%) participants had good knowledge of hand hygiene. (Table 3)

There was no evidence of statistically significant association between the knowledge of hand hygiene and age, sex and profession of the participants. Similarly, there was no association between receiving of formal training in last 3 years and the knowledge scores of the participants in hand hygiene ($\chi^2:1.004$, DF=2, $p=0.605$).

The participants who used alcohol routinely in their practice had a significant association with receiving of formal training in last 3 years ($\chi^2:15.890$, DF=1, $p=0.000$). The study results showed that the routine use of alcohol in their hand hygiene practices was significantly associated with the profession being a medical student ($\chi^2:17.393$, DF=4, $p=0.002$).

Table 1:- Characteristics of the study participants.

Age group (in years)	Frequency (n)	Percentage (%)
18 – 25	108	62.8
26 – 35	59	34.3
≥36	5	2.9
Sex		
Female	85	49.4
Male	87	50.6
Qualification		
Medical post graduate	27	15.7
Medical intern	30	17.4
Medical undergraduate	52	30.2
Staff Nurse	37	21.5
Nursing student	26	15.1
Received formal training in last three years		
Yes	134	77.9
No	38	22.1
Routine use of alcohol based hand-rub in hand hygiene		
Yes	132	76.7
No	40	23.3

Table 2:- Knowledge of hand hygiene among the study participants.

Questions (Correct response)	Frequency (n)	Percentage (%)
Main route of cross-transmission of potentially harmful germs between patients in a health-care facility?		
Healthcare workers' hands when not clean (Yes)	89	51.7
Most frequent source of germs responsible for healthcare associated infections.		
Germs already present on or within the patient (Yes)	42	24.4
Which hand hygiene actions prevents transmission of germs to the patient?		
Before touching a patient (Yes)	122	70.9
Immediately before a clean/ aseptic procedure (Yes)	17	9.9
Which hand hygiene actions prevents transmission of germs to the health-care worker?		
After touching a patient (Yes)	81	47.1
After exposure to immediate surroundings of a patient (Yes)	24	30.9
The minimal time needed for alcohol-based hand-rub to kill most germs on your hands		
20 seconds (Yes)	97	56.4
The type of hand hygiene method is required before palpation of the abdomen.		
Rubbing (Yes)	116	67.4
The type of hand hygiene method is required before giving an injection.		
Rubbing (Yes)	111	64.5
The type of hand hygiene method is required after emptying a bedpan.		
Rubbing (Yes)	40	23.3
The type of hand hygiene method is required after removing examination gloves.		
Rubbing (Yes)	61	35.5
The type of hand hygiene method required after making a patient's bed.		
Rubbing (Yes)	57	33.1

The type of hand hygiene method is required after visible exposure to blood.		
Washing (Yes)	142	82.6
Associated with increased likelihood of colonization of hands with harmful germs.		
Damaged skin (Yes)	119	69.2
Artificial nails (Yes)	68	39.5

Table 3:-Level of knowledge regarding hand hygiene among the study participants.

Knowledge score	Frequency (n)	Percentage (%)
Good ($\geq 70\%$)	4	2.3
Moderate (50 – 75%)	107	62.2
Poor ($< 50\%$)	61	35.5

Discussion:-

This study aimed to assess the knowledge of hand hygiene among the medical and nursing professionals of a tertiary care teaching hospital in South Gujarat, India. The study findings revealed that 62.2% of the study participants had moderate knowledge of recommended hand hygiene while 35.5% had poor knowledge. Moderate knowledge among healthcare workers in hospital settings is also reported in studies conducted in Nigeria, Iran, India and Pakistan.⁽¹¹⁻¹⁴⁾ The study participants also implied that damaged skin and wearing artificial fingernails could be the source of spreading germs in hospital settings.^(15,16)

The knowledge of hand hygiene had no association with the gender of the study participants in our study. Contrasting finding was obtained in a cross sectional study done in Hong Kong where females had higher knowledge than male healthcare workers.⁽¹⁶⁾ Our study results found no association between receiving of formal training in last 3 years and the knowledge scores of the participants in hand hygiene. The literature review showed a contrasting result where healthcare workers who received formal training had better perception of hand hygiene only and was not associated with knowledge.⁽¹⁷⁾

It was evident from the study results that moderate knowledge among the healthcare personnel was the main barrier in maintaining good hand hygiene practices. More repeated and frequent training courses along with infection prevention and control team should be deployed for promoting good hand hygiene practices.

Conclusion:-

Majority of the study participants had moderate knowledge regarding the hand hygiene methods. Medical students had higher knowledge of hand hygiene in comparison to the nurses and the nursing students. The study concluded that despite repeated trainings on health hygiene, almost all the healthcare workers had poor to moderate knowledge on health hygiene. The knowledge did not increase among the study participants irrespective of repeated refresher trainings. Thus, it can be concluded that mere trainings will not suffice in healthcare settings. The Hospital Acquired Infection Control Committee should be strict enough so that all the healthcare workers adhere to these guidelines and practice the same because unless the practice of hand hygiene is implemented the knowledge will eventually decrease over a period of time.

Strengths of the study:

The findings of the study will be useful for hospital authorities and the Hospital Acquired Infection Control Committee in framing policies and protocols for the hospital staff and also suggesting newer methods of teaching for the students. This study will sensitize the hospital authorities in regard to conduction of regular and refresher training on hand hygiene for all the healthcare workers.

Financial Support:

Nil.

Conflict of Interest:

Nil.

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