

HAND HYGIENE: A SCHOLASTIC INTERVENTION PROJECTING THE BOTTOM OF HIERARCHY OF HEALTH CARE WORKERS

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Abstract

Background: Amid this escalating pandemic crisis, adequate awareness about spread, control and prevention of COVID 19 is of utmost importance. As there is an emerging evidence on the presence of viable viral particles in the secretions and excreta of patients, untreated sewage, surfaces, it has become indispensable concern for the health care providers to be aware about the WASH (water, sanitation and hygiene) risks and practices. Hand hygiene is the leading measure for reducing healthcare-associated infections (HCAIs) and preventing the spread of antimicrobial resistance. **Objective:** The objective of this study was to evaluate the knowledge, attitude and practices of hand hygiene among housekeeping staff, technicians and attendants working in COVID-19 tertiary health care Centre. **Materials and Methods:** The study was conducted for the then present staff in JK hospital, COVID centre, Bhopal in the month of July, 2020. A standard form for recording the data was made. Housekeeping staff and attendants were involved from all the clinical departments. The tools for the data collection were: questionnaires including multiple choices, yes/no answers. A prior orientation was provided to the respondents regarding how to fill the questionnaire. The questions were verbally asked by the researcher and the responses were sought. **Result:** A total of 83 health care workers participated in the study. Amongst the total participants, 37.34% were males and 65.65% were females. Most of the participants were in the age group of 18-39 years, 69.88% of them had gained knowledge about infection control in COVID-19 through hospital, 74.70% of them had received training about hand hygiene in past 6 months. Comparing the pre and post training responses, it was observed that the knowledge component significantly increased on post training evaluation regarding correct steps of hand hygiene (90.31% from 55.01%). There was remarkable increment from 55.16% to 95.54% in the practice element of hand hygiene on post training evaluation for all the five moments. Women showed 42% improvement in their knowledge, attitude and practice of hand hygiene after training in comparison to men who did not show a significant habit change. **Conclusion:** Our study portrays moderate level of knowledge regarding many aspects of hand hygiene among health care workers. Education plays an important role in overcoming these barriers and makes it easy to incorporate changes in hand hygiene habits of healthcare workers. Middle aged workers show more sense of responsibility towards habit change as compared to the young.



INTRODUCTION

Amid this escalating pandemic crisis, adequate awareness about spread, control and prevention of

COVID 19 is of utmost importance. COVID 19 emerged in Wuhan, China, in December 2019, has been declared as pandemic on 11th march, 2020 by world health organization. Housekeeping staff,

technicians and attendants play a pivotal role in prevention and control of transmission of the infection through application of customary precautions to aid the management of occupational exposure in maintenance of health care setting. In any health care centre, infected patients are contagious to other patients, health care workers and visitors and thus become a source of transmission.

As there is emerging evidence on the presence of viable viral particles in the secretions and excreta of patients, untreated sewage, surfaces, it has become indispensable concern for the health care providers to be aware about the WASH (water, sanitation and hygiene) risks and practices. Hand hygiene is the leading measure for reducing healthcare-associated infections (HAIs) and preventing the spread of antimicrobial resistance.^[1,2]

The aim of this study was to evaluate the knowledge, attitude and practice of 83 housekeeping staff, technicians and attendants working in operation theatre, laboratory, medical and surgical units at tertiary health care centre in relation to infection control measures in perspective of COVID 19.

MATERIALS AND METHODS

The study was conducted on the then present staff of JK hospital, COVID centre, Bhopal, in the month of July, 2020.

After ethical approval from the institutional Ethics Review Committee of LN medical college and JK hospital, Bhopal, verbal consent was obtained from the participants prior to the administration of questionnaire, after the research assistants explained the purpose of the study to participants.

83 participants of both genders participated in this study. The participants were explained about the objective of the study and verbal consent was obtained from them.

Housekeeping staff, technicians and attendants from wards of Medicine, Surgery, Obstetrics and Gynaecology, TB and Chest, Paediatrics, Skin and Venereal Disease clinic, Intensive care unit and operation theatres were included in the study.

Respondents were asked questions individually without mutual consultations.

Study design

The included staff were asked verbally questions from a self-structured questionnaire containing 27 questions divided in three sets including:

- Personal and socio demographic data (4 questions)
- Knowledge about infection control in perspective of COVID 19. (6 questions)
- Knowledge about hand hygiene (7 question), attitude about cross infection (5 questions) and practice of 5 moments of hand hygiene (5 questions)

Questions were framed either as multiple-choice out of which participant had to choose the most appropriate answer according to him/her or it was in form of yes/no answers. After this, the study participants were provided with a thorough training about infection control and hand hygiene practices with the help of lectures and demonstrations at JK hospital and the same set of questions were asked again. The pre training and the post training data were analysed.

Inclusion criteria

House-keeping staff, Attendants, Technician.

Exclusion criteria

Staff's refusal, Staff with hearing problems, Staff with speech difficulty, Staff absent at the time of study.

RESULTS

Table 1: Demographic Details

Variable	Characteristic	Percentage %
Gender	Male	45.34
	Female	55.65
Age	18-29	37.34
	30-39	37.34
	40-49	4.82
	50-59	20.48
Education	Illiterate	21.3
	Primary Education	33.02
	Secondary education	22.67
	Graduate/Post graduate	22.9
Department of work	House keeping staff	48.19
	Attendants	28.92
	Technicians	22.89

Table 2: Knowledge About Hand Hygiene Practices in Covid-19

Questions	Answers	Percentage (n=83)
Source of knowledge about infection control in perspective of covid 19	Social media	10.84%
	Family/friends	19.28%
	Through hospital	69.88%
Do you get education about infection control at your institution?	Yes	100.00%
Have you received any training about hand hygiene at your institution in past 6 months?	Yes	74.70%
Do you find such trainings effective?	Yes	84.34%
Have these trainings changed your hand hygiene practices?	Yes	60.24%
Do you want such demonstrations in future?	Yes	75.90%

Table 3: Comparison of Pre and Post Training Correct Responses Regarding Knowledge and Attitude About Hand Hygiene

SN	Questions	Answers	% (n=83) pre training	% (n=83) post training	p value
1	How often do you use alcohol based rubs in a typical work day?	8+ times	49.04%	94.63%	0.0002
2	Do you prefer alcohol based rubs over hand washing?	yes	62.65%	96.39%	0.00001
3	If hands are soiled you should do?	hand washing	68.67%	93.98%	0.0021
4	What should be the duration of hand washing?	1 min	48.19%	91.47%	0.028
5	What should be the duration of hand rubbing?	30 sec	26.51%	91.02%	0.028
6	Hand hygiene reduces?	Cross infection	72.29%	92.18%	0.0093
7	Hand rubbing is more effective against micro-organisms than hand washing.	yes	25.30%	88.15%	0.2001

Table 4: Comparison of Pre and Post Training Correct Responses Regarding Attitude of Hand Hygiene in Contestants

8	Do you wear gloves while dealing with patients?	yes	68.67%	96.77%	0.00001
9	Do you wear cap while dealing with patients?	yes	34.94%	90.40%	0.0644
10	Do you wear mask while dealing with patients?	yes	100.00%	93.54%	0.0021
11	Do you wear gown/apron while dealing with patients?	yes	45.78%	87.47%	0.294
12	Do you wear sheild/ goggle while dealing with patients?	yes	27.28%	89.12%	0.122

Table 5: Practice of Who Recommended 5 Movements of Hand Hygiene

Sr. No	Questions	Response Of Students	Response Of Students	p value
13	do you practice hand hygiene	no% (n=83) pre training	no% (n=83) post training	
1	Before touching a patient? (yes)	36.14	96.81	0.00001
2	Before clean/aseptic procedure? (yes)	76.31	98.22	0.00001
3	After body fluids exposure? (yes)	72.28	96.38	0.00001
4	After touching a patient? (yes)	42.16	97.98	0.00001
5	After touching a patient's surroundings? (yes)	48.19	88.34	0.2001

Age Specific Improvement



Figure 1(a): Age Specific Improvement (Before Training)

Gender Specific Improvement

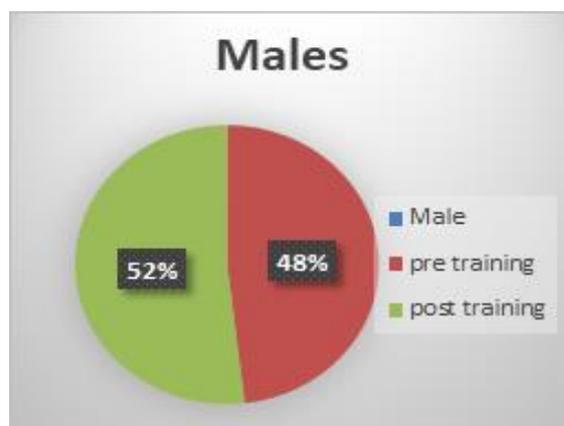


Figure 2(a): Gender Specific Improvement (Males)



Figure 1(b): Age Specific Improvement (After Training)

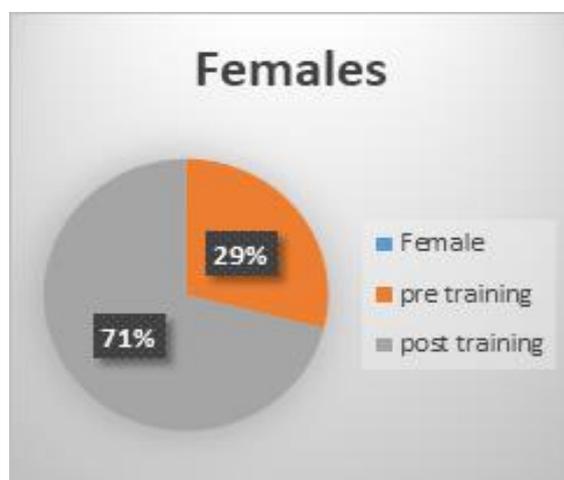


Figure 2(b): Gender Specific Improvement (Females)

Education Specific Improvement

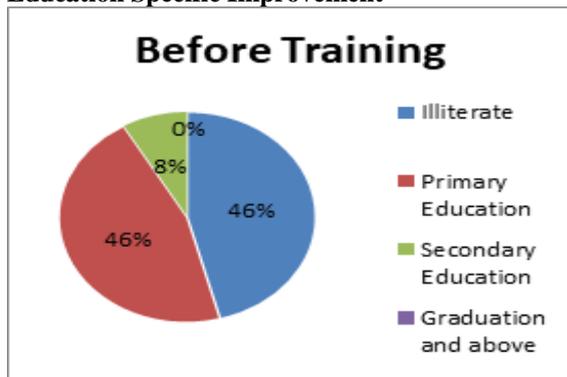


Figure 3(a): Education Specific Improvement (Before Training)

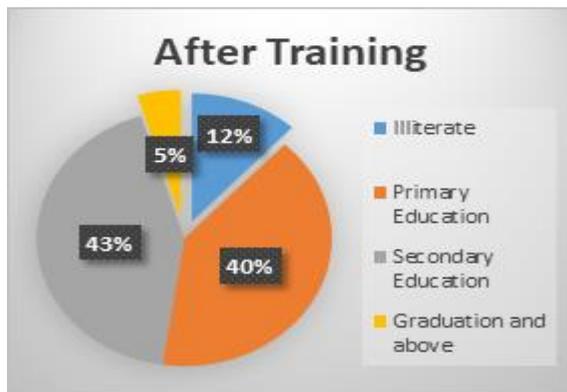


Figure 3(b): Education Specific Improvement (After Training)

Department Specific Improvement



Figure 4(a): Department Specific Improvement (Before Training)



Figure 4(b): Department Specific Improvement (After Training)

A total of 83 health care workers participated in the study. Amongst the total participants, 37.34% were males and 65.65% were females. Most of the participants were in the age group of 18-39 years who remained in direct and indirect contact with the patient and patient's surroundings.

Almost half (48.19%) of the participants were from the house keeping staff. Only one fifth of the participants were illiterate, rest all of them had received at least primary education. The questions asked along with their correct responses are given in [Table 1-4].

Out of these 83 contestants, 69.88% of them had gained knowledge about infection control in COVID-19 through hospital, 74.70% of them had received training about hand hygiene in past 6 months. The response about: effectiveness of these trainings, habit change, and want for such demonstrations in future were, 84.34%, 60.24%, 75.90%, respectively.

Comparing the pre and post training responses, it was observed that the knowledge component significantly increased on post training evaluation regarding correct steps of hand hygiene (90.31% from 55.01%).

In a similar manner, some other areas which showed significant improvement from an average of 50.08% to 92.54%, after training, were knowledge regarding duration of hand hygiene, role of hand washing over hand rub for soiled hands, knowledge about cross infection and effectiveness of hand rub.

It was also observed, the use of PPE such as gown and goggles showed much improvement after training. The overall increment in their usage was from 55.016% to 95.546%.

Regarding the evaluation of attitude towards hand hygiene, it was observed that the more than 50% of participants had positive attitude but this increased to >90% after training [Table 3]. There was also remarkable increment from 55.16% to 95.54% in the practice element of hand hygiene on post training evaluation for all the five moments as per WHO recommendation. The participants' responses to the majority of the questions, significantly improved after training.

The age group of 50-59 years portrayed a drastic improvement in their habits from 4% to 40 percent post training. (Diagram 1, Diagram 2) Women showed 42% improvement in their knowledge, attitude and practice of hand hygiene after training in comparison to men who did not show a significant habit change. (Diagram 3, Diagram 4)

Participants who had received secondary education gave a positive change in their habits from 8% prior training to 43% after training. (Diagram 5, Diagram 6) Attendants improved their habits from 21% to 43% after training. (Diagram 7, Diagram 8)

Statistical analysis

Data was computed, statistical tests mean values and percentages were calculated. P values were obtained using z value.

Null hypothesis: $H_0: \mu = 0.85$ Vs $H_a: \mu \neq 0.85$

- H_0 : there is no significant between pre training habit and post training habits
- H_a : there is significant between pre training habit and post training habits

The p values <0.05 were considered to be significant. Statistical analysis of the data was done and it was found to be statistically significant for all the parameters (Knowledge, attitude and practice).

DISCUSSION

Hands are the most common vehicle for the transmission of pathogens within the healthcare environment. Hand hygiene is the leading measure for reducing healthcare-associated infections (HCAIs) and preventing the spread of antimicrobial resistance. The WHO guidelines on hand hygiene in health care provide health-care workers (HCWs), hospital administrators and health authorities with a thorough review of evidence on hand hygiene in health care and specific recommendations to improve practices and reduce transmission of pathogenic microorganisms to patients and HCWs. The present guidelines were coined by Sax H et al., in American journal of infection control and are intended to be implemented in any situation in which health care is delivered either to a patient or to a specific group in a population.^[1,2]

An educational intervention targeting grass root level was done by Chauhan K et al., to evaluate the knowledge, attitude and practices of hand hygiene among third semester medical students. There was a significant improvement in knowledge, attitude and practice towards hand hygiene among students after intervention, as seen on comparison of results of post-test questionnaire from its pre-test counter-part because the doubts in the mind of the students got cleared in the education sessions. Shinde MB et al., did a study to assess knowledge, attitude, and practices of five moments of hand hygiene among nursing staff and students at a tertiary care hospital at Karad. Similar study was done by Nair SS, Hanumantappa R et al., among medical and nursing students at a tertiary health care centre in Raichur, India. It was concluded that targeting medical and nursing students and teaching them the good standard practices was fruitful as they were young, easy to mold and enthusiastic and above all they are the future doctors and nurses. In our study, the health care workers had a moderate level of knowledge regarding many aspects of hand hygiene, which was a positive finding although knowledge in some areas regarding use and efficacy of hand rubs was poor, which significantly improved to more than $>90\%$ after training.^[3,4,5]

Boyce JM et al., gave guideline for hand hygiene in health-care settings. They also made recommendations of the Healthcare Infection Control Practices Advisory Committee and the

HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. It was done to promote improved hand-hygiene practices and reduce transmission of pathogenic microorganisms to patients and personnel in health-care settings. Recent studies demonstrating the value of multidisciplinary hand-hygiene promotion programs and the potential role of alcohol-based hand rubs in improving hand-hygiene practices were summarized. Recommendations concerning related issues (e.g., the use of surgical hand antiseptics, hand lotions or creams, and wearing of artificial fingernails) are also included.^[6]

The WHO regards hand hygiene as an essential tool for the prevention of nosocomial infection, but compliance in clinical practice is often low. Kampf G et al., gave relevant scientific literature and national and international evidence-based recommendations stating that hand hygiene is necessary for the prevention of nosocomial infections. Compliance can be improved by training, by placing hand-rub dispensers at the sites where they are needed, and by physicians setting a good example for others. Improved compliance in hand hygiene, with proper use of alcohol-based hand rubs, can reduce the nosocomial infection rate by as much as 40% .^[7]

Al Kadi A et al., conducted a study to evaluate the awareness, and compliance of hand hygiene among undergraduate medical students during their clinical phase in Qassim College of Medicine, Saudi Arabia. A questionnaire based on World Health Organization's concept of "Five Moments for Hand Hygiene" was used to evaluate the awareness of the indications for hand hygiene and compliance was observed during Objective Structured Clinical Examination (OSCE) sessions. It was concluded that serious efforts are needed to improve the hand hygiene practices among medical students. Mathai E et al educated healthcare workers to optimal hand hygiene practices. It was essential to improve practices and was an integral part of hand hygiene promotional strategies. Healthcare worker education has a positive impact on improving hand hygiene and reducing healthcare-associated infection.^[8,9]

Hand hygiene has now been recognised as one of the most effective intervention to control the transmission of infections in a hospital and education is an important tool to ensure its implementation. In order to convince the users and as a part of education, it is important to generate evidence on the role of hand hygiene in reducing the bacterial flora on their hands. The present study by Kapil R et al., was undertaken in a tertiary care hospital to demonstrate the presence of bacterial flora on the hands of healthcare workers (HCW) in different categories, to teach them proper hand hygiene technique using alcohol-based hand rub and determine the outcome for reduction of bacteria. Majority (42 out of 60) of the HCWs had bacterial count up to 100 colonies or more on both hands before the application of hand rub while working in

the hospital. After use of alcohol hand rub with a proper hand hygiene technique, it was found that the percentage reduction was 95-99% among doctors and nurses, 70% among hospital attendants and 50% among sanitary attendants. The study demonstrates that transient bacteria are present on the hands of HCWs but majority could be removed by proper hand hygiene, which needs continuous education to be effective.^[10]

Pittet D advocated a multidisciplinary approach Improving adherence to hand hygiene practice. Hand hygiene prevents cross-infection in hospitals, but health-care workers' adherence to guidelines is poor. Easy, timely access to both hand hygiene and skin protection is necessary for satisfactory hand hygiene behavior. Alcohol- based hand rubs may be better than traditional handwashing as they require less time, act faster, are less irritating, and contribute to sustained improvement in compliance associated with decreased infection rates. This article reviews barriers to appropriate hand hygiene and risk factors for noncompliance and proposes strategies for promoting hand hygiene. In our study, knowledge regarding correct steps of hand hygiene as per WHO "My five moments of hand hygiene" protocol was only in 55% on pre training evaluation which significantly improved to 95.54% after the training. Similarly, knowledge of participants regarding constituents of hand rub and duration of surgical scrub increased to 97.32% and 90.02% respectively post training.^[11]

Although hand hygiene (HH) compliance has been an important issue for years, the compliance rate is still a problem in health care today. Tromp M et al., showed the short-term and long-term effectiveness of a multidisciplinary hand hygiene improvement program. This was an observational, prospective, before-and-after study. The authors measured HH knowledge and HH compliance before (baseline), directly after (poststrategy), and 6 months after the performance of HH team strategies (follow-up). The study was composed of employed nurses and physicians working in the department of internal medicine of a university hospital. We performed a multifaceted improvement program including HH education, feedback, reminders, social influence activities including the use of role models, and improvement of HH facilities. Our multifaceted HH improvement program resulted in a sustained improvement of HH knowledge and compliance in nurses as well as physicians.^[12]

Several other studies like Smiddy MP et al., who did systematic qualitative literature review of health care workers' compliance with hand hygiene guidelines, Assefa D et al., who studied knowledge, attitude and self-reported performance and challenges of hand hygiene using alcohol-based hand sanitizers among healthcare workers during COVID-19 pandemic. Sharif A et al., and Paudel IS et al., did Knowledge, attitude, and performance survey of nurses and nursing students toward hand hygiene in hospitals. Similar cross-sectional survey

was done by Naik S et al., on knowledge, attitude, and practice of hand hygiene among dentists practicing in Bangalore city. All show how noncompliance with hand hygiene guidelines remains a collective challenge that requires researchers to adopt a consistent and standardized approach. Theoretical models should be used intentionally to better explain the complexities of hand hygiene^[13,14,15,16,17]

Detailed practical guidance on steps for the organization of education programmes in healthcare facilities and teaching-learning strategies are provided using the World Health Organization (WHO). Several key elements for a successful educational programme were also identified. A particular emphasis was placed on concepts included in the tools developed by WHO for education, monitoring and performance feedback. Our study showcases the pivotal role that education and training of health care workers regarding hand hygiene practices, plays in reducing the cross infection preventing HCAs. The use of alcohol-based hand rubs and ongoing instructional initiatives are important factors in overcoming infrastructure constraints and improving understanding. Majority of our health care workers had an uplifting outlook towards hand hygiene in the wake of preparing and began rehearsing the 5 moments of hand hygiene and increment adherence was seen towards rehearsing other parameters.

CONCLUSION

Our study portrays moderate level of knowledge regarding many aspects of hand hygiene among health care workers. This lacuna can be readily fulfilled via thorough training and regular drills, thereby improving the standard of care and reducing the incidence of health care acquired infections.

Limitations

A few setbacks in this study include:

- It can only be assumed that improvements in the health care worker's KAP was due to the training given, but it cannot be ascertained as improved practices were not evaluated in wards.
- Follow up studies were not carried out to evaluate the long term effectiveness of training.
- A comparative study between doctors, medical students, nurses and staff can be performed in future to find out the significant variation of training between groups.

Highlights of the Study

- Education plays an important role in overcoming these barriers and makes it easy to incorporate changes in hand hygiene habits of healthcare workers.
- Middle aged workers show more sense of responsibility towards habit change as compared to the young.

- It is therefore, important to assess all determinants which have a significant impact on healthcare, such as age, gender, education and department in order to have a comprehensive refinement of the hand hygiene practices in the healthcare system.

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