



DEVELOPMENT OF COMPETENCY AMONG HEALTH CARE WORKERS AND STUDENTS IN HANDWASHING TECHNIQUE TO REDUCE NOSOCOMIAL INFECTIONS

Microbiology

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KEYWORDS

INTRODUCTION :

Hand washing, also known as hand hygiene, is the act of cleaning hands for the purpose of removing soil, dirt and microorganisms. The main medical purpose of washing hands is to cleanse the hands of pathogens (like bacteria and viruses) and chemicals which can cause diseases, thus reducing the burden of hospital acquired infections¹. Literature suggests Indian medical undergraduates are not aware of handwashing technique and so are the health care workers. Base of tackling this lack of competency can be laid in preclinical stage of medical students by training students and health care staff in handwashing so as to lower the incidence of nosocomial infections.

According to WHO, there are few definitive data on the patient-care activities that are most likely to transmit bacteria to health care worker (HCW) hands, but there have been several studies that identified many possibilities. Although bacteria have been found on HCW hands after activities such as wound care, intravascular catheter care, respiratory tract care and handling patient secretions as expected, bacteria also have been found on HCW hands after so-called "clean" contact, such as taking a patient's pulse, temperature or blood pressure².

Each year in India, patients get more than a million infections in the hospital while being treated for something else. The best way to help prevent infection is to practice proper hand hygiene. Hand Hygiene Saves Lives shows how patients can play an active role in reminding healthcare providers to practice hand hygiene in hospitals and other healthcare facilities.

Washing hands before and after patient contact seems like a simple solution to prevent the spread of bacteria between patients. Most hospitals have hand hygiene policies in place that guide their employees to do just that.

AIM AND OBJECTIVES:

HCWs are able to demonstrate all the steps of hand washing
HCWs are able to describe various organisms causing nosocomial infections and are able to enlist measures to prevent it

- To be able to perform all the steps of hand washing
- To be able to demonstrate steps of handwashing
- To be able to describe various organisms causing nosocomial infections
- To be able to enlist measures to prevent nosocomial infections

REVIEW OF LITERATURE :

Hand washing (or handwashing), also known as hand hygiene, is the act of cleaning hands for the purpose of removing soil, dirt, and microorganisms. If water and soap is not available, hands can be cleaned with ash instead. Medical hand hygiene refers to hygiene practices related to medical procedures. Hand washing before administering medicine or medical care can prevent or minimize the spread of disease. The main medical purpose of washing hands is to cleanse the hands of pathogens (like bacteria or viruses) and chemicals which can cause harm or disease. This is especially important for people who handle food or work in the medical field, but also important practice for the general public.

Hand washing with soap consistently at critical moments during the day prevents the spread of diseases like diarrhea and cholera which are transmitted through –fecal-oral routes. People can become infected with respiratory diseases such as influenza or the common cold, for example, if they do not wash their hands before touching their eyes, nose, or mouth.

Five critical times during the day⁷⁻¹⁰

There are five critical times during the day where washing hands with soap is important to reduce fecal-oral transmission of disease: after defecation, after cleaning a child's bottom, before feeding a child, before eating and before preparing food or handling raw meat, fish, or poultry.

In many countries, there is a low prevalence of hand washing with soap. A study of hand washing in 54 countries in 2019 found that on average, 38.7% of households practiced hand washing with soap. Several behavior change methodologies now exist to increase uptake of the behavior of hand washing with soap at the critical times.

Group hand washing for school children at set times of the day is one option in developing countries to engrain hand washing in children's behaviors.⁹

Antibacterial soap

Antibacterial soaps have been heavily promoted to a health-conscious public. However, antibacterial soaps contain common antibacterial agents such as triclosan, which has an extensive list of resistant strains of organisms. So, even if antibiotic resistant strains aren't selected for by antibacterial soaps, they might not be as effective as they are marketed to be.

Water and hand rubs

Hand sanitizers are most effective against bacteria and less effective against some viruses. Alcohol-based hand sanitizers are almost entirely ineffective against Novel Coronavirus or Norwalk type viruses, the most common cause of contagious gastroenteritis. Enough hand antiseptic or alcohol rub must be used to thoroughly wet or cover both hands. The front and back of both hands and between and the ends of all fingers are rubbed for approximately 30 seconds until the liquid, foam or gel is dry. As well as finger tips must be washed well too rubbing them in both palms alternatively.

Organisms found on HCW hands after such patient contact range from *Klebsiella* spp., *Staphylococcus aureus*, *Clostridium difficile*, MRSA and gram-negative bacteria. However, direct patient contact is not the only way HCW hands can be contaminated. HCWs can acquire bacteria on their hands by touching contaminated surfaces in the patient environment and simply by touching a contaminated chart at the nurses' station, according to the literature.

METHODOLOGY:^{3,8,9,11}

Sensitization of the faculty members on the concept of teaching handwashing steps and its importance.

Permission from the IEC (institutional ethical committee)

Written consent from the students participating in the study

Handwashing workshop was conducted with the help of faculty of infection control department and Microbiology department.

Study group: Health care personnels

Sample size: 50 students

Teaching learning method: Lecture, demonstration and hands on training.

Evaluation: Pre and post test evaluation by standardized validated questionnaire.

For assessment of skills: Direct observation of procedure, split in steps, using a checklist.

Workshop evaluation: Feedback questionnaire using likert scale. Pre and post test mean were compared using paired T test to determine statistical significance.

A post test questionnaire and feedback for the evaluation

Performing all the steps of hand hygiene and use of hand washing and use of alcohol based hand rub was taught simultaneously.

The World Health Organization has "Five Moments" for washing hands:

- Before patient care
- After environmental contact
- After exposure to blood/body fluids
- Before an aseptic task, and
- After patient care.

RESULTS

A randomized controlled trial was conducted among the health care personnel and medical students of Geetanjali Medical College and Hospital, Udaipur.

Total number of students were 50.

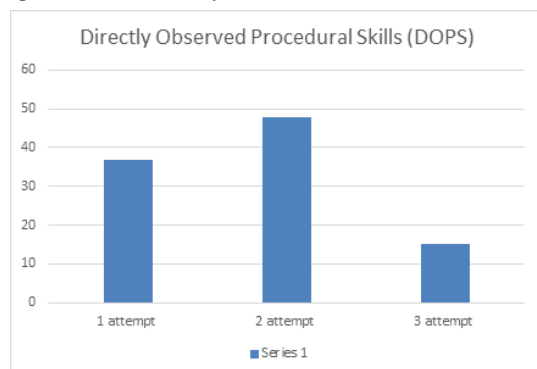
Table :1

Pre and post test mean were compared using paired T test to determine statistical significance.

RESULTS	Pre-Test Mean /SD	Post test Mean/SD	p Value
N=50	2.93+1.12	4.07+0.66	0.034 Significant

There was statistically significant improvement in knowledge of students as shown from results of pre and post questionnaire. After giving didactic lectures and demonstrations by the faculty of Infection Control Department, students were able to perform all the steps of handwashing according to WHO guidelines. They were able to even demonstrate the steps thus learning the importance and use of handwashing.

Graph 1: Result of Directly Observed Procedural Skills



In the present graph it was observed that 37.0% students could complete all steps correctly in 1st attempt, 48.0% in 2nd attempt and 15.0% students required 3rd attempt to correctly complete all steps.

Hence, all the students could do all the steps of handwashing in a given frame of time, by attempting once, twice or thrice. Thereby all the students learned the importance of knowing all the steps correctly.

Table 2: Feedback of students of the lecture/ demonstration

EXCELLENT	GOOD	FAIR
63%	26.3%	10.7%

On the basis of demonstrations given, a feedback form was collected wherein students addressed that 63% of students found the lecture was excellent, wherein 26.3% found it good and 10.7 % concluded it to be fair

CONCLUSION AND IMPLICATIONS

The results of this study suggest that the workshop provided students with sound basic knowledge and practical skills in handwashing. Same students will be followed up and if required, trained, with modifications in workshop will be done to help them. The promotion and advocacy of hand washing with soap can influence policy decisions, raise awareness about the benefits of hand washing and lead to long-term behavior change of the population in skills satisfactorily

aimed at reducing nosocomial infections .

Three Star Approach" by UNICEF that encourages schools to take simple, inexpensive steps to ensure that students wash their hands with soap, among other hygienic requirements. When minimum standards are achieved, schools can move from one to ultimately three stars. Building hand washing stations can be a part of hand washing promotion campaigns that are carried out in order to reduce diseases and child mortality.

Hand hygiene is the leading infection prevention measure. It has to be performed according to appropriate indications for cleaning hands at the point of care during the patient care process, which are defined by the WHO's Five Moments for Hand Hygiene: before patient contact, before aseptic procedure, after exposure to body fluid regardless of wearing gloves, after patient contact, and after contact with the patient's environment, regardless of patient contact. Global Hand washing Day (15 October) is another example of an awareness-raising campaign that is trying to achieve behavior change.

REFERENCES:

1. The Hygiene Improvement Project (HIP) - Tippy-Tap: A simple low-cost technology for handwashing when water is scarce". USAID. Archived from the original on 25 October 2014. Retrieved 30 September 2015.
2. Cowling, Benjamin J.; et al. (2009). "Facemasks and Hand Hygiene to Prevent Influenza Transmission in Households". *Annals of Internal Medicine*. 151 (7):437–46.
3. Luby, Stephen P.; Agboatwalla, Mubina; Painter, John; Altaf, Arshad; Billhimer, Ward; Keswick, Bruce; Hoekstra, Robert M. (2006). "Combining drinking water treatment and hand washing for diarrhoea prevention, a cluster randomized controlled trial". *Tropical Medicine & International Health*. 11 (4): 79–89.
4. Scott, Beth; et al. "Protecting Children from Diarrhoea and Acute Respiratory Infections: The Role of Hand Washing Promotion in Water and Sanitation Programmes" (PDF). Archived from the original (PDF) on 28 June 2009. Retrieved 21 May 2009.
5. Dangour, Alan D (1996). "Interventions to improve water quality and supply, sanitation and hygiene practices, and their effects on the nutritional status of children" (PDF).
6. Curtis, Val; Cairncross, Sandy (May 2003). "Effect of washing hands with soap on diarrhoea risk in the community: a systematic review". *The Lancet Infectious Diseases*. 3(5): 275–281.
7. Ejemot, Regina I; Ehiri, John E; Meremikwu, Martin M; Critchley, Julia A (2009). "Cochrane review: Hand washing for preventing diarrhoea". *Evidence-Based Child Health: A Cochrane Review Journal*. 4 (2): 893–939.
8. Cairncross, S.; Hunt, C.; Boisson, S.; Bostoen, K.; Curtis, V.; Fung, I. C.; Schmidt, W. P. (2010). "Water, sanitation and hygiene for the prevention of diarrhoea". *International Journal of Epidemiology*. 39 (Supplement 1): i193–i205
9. World Health organisation. WHO guidelines on hand hygiene in healthcare. 2009
10. Moo-Sik Lee, Hong Su Jin , Kim Young Taek. Handwashing with soap and national handwashing projects in Korea: focus on the National Handwashing Survey, 2006-2014. *Epidemiology and health journal* 2015;37
11. Global Public-Private Partnership for Handwashing Global handwashing day planner's guide Available from: <https://drive.google.com/file/d/0BzyZRS1q0pLBSEFKdZU4Z0xaYkU/view>.