Original Article

Knowledge, Attitude, And Practice Regarding Infection Control Among Sanitary Workers In A Tertiary Care Teaching Hospital.

Snehal Dhayagude, Bhargavi Srinivasan , Abhijeet Mane , Anuradha Tolpadi

Abstract:

Background: Sanitation workers are responsible in maintaining clean environment in hospitals. Assessing their knowledge, attitude and practices can help in controlling the increasing load of nosocomial infections. Due to a lack of previous research on this topic, especially in India, there is not enough understanding regarding their knowledge, methodology and the challenges faced by them.This study aims to address this data gap by investigating these aspects and providing valuable insights into improving infection control practices.

Methodology: We conducted a cross-sectional study involving 405 sanitation workers at a tertiary care teaching hospital. Data were collected using an online questionnaire created through a review of the literature, including CDC and WHO guidelines. The questionnaire was available in both English and Marathi to ensure accessibility. To enhance the representativeness of the sample, data collection was distributed across different shifts.

Results: Total 405 consenting participants in the study answered the questionnaire. 233 scored above 50% while 172 could secure below 50%. We found that Knowledge about wearing gloves is 95.3% among sanitary workers and their attitude for hand hygiene on gloved hands was 96.5% and 98.8% do wash their hands after removing gloves. Response was relatively poor to questions related to occupational hazards (67%) and spill managements (62%).

Conclusion: Hand Hygiene knowledge & compliance are satisfactory in this study but attitude towards workload and knowledge about potential infections need to be improved, with a focus on training of sanitary workers.

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INTRODUCTION

Infection prevention and control is defined as a set of precautions or policy that aims to improve the environment surrounding healthcare providers and patients, as well as reduce the transmission of infections in healthcare set up[1]. As per WHO, 7 out of 100 hospitalized patients will contract nosocomial infection during their stay in hospitals in developed countries, while the number is 10 out of 100 in developing countries [2]. WHO also states that one of the most important indicators of hospital-acquired infections is having poor knowledge, attitude, and practices on infection prevention and control [3]. Sanitary workers are key to maintaining hygiene in the healthcare facilities thereby contributing immensely to global health by ensuring safe environment for hospitals.

The Kayakalp guidelines from the Government of India clearly outline the roles and responsibilities of sanitary workers in a hospital. Sanitary workers are involved in cleaning & disinfection of healthcare environments, transportation of patients, movements of patients, handling and transporting specimens to laboratory ,biomedical waste disposal and assist nursing staff, sanitary inspector and other officials [4]. Sanitary workers are always in close proximity to patients, contaminated fomites and equipment's, patients' specimens, and hazardous biomedical waste during their working hours [4,5]. Which makes them a highly vulnerable group among hospital staff [6]. Furthermore, sanitary workers in developing countries belong to low socio-economic group with mostly low level of education.

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Attrition rate is also high among sanitary workers, necessitating regular training [7,8]. In India, many hospital have outsourced the sanitary workforce. Outsourcing is done as per guidelines given by Kayakalp guidelines and requirements given by various accreditation agency.

Though outsourcing is cost effective for hospitals, it is difficult to accurately assess hygiene practices of sanitary workers, and their compliance to Infection prevention and control policies. The workers generally Follow oral instructions. from their supervisors, and most of them are on rotational duties (not assigned to particular critical areas like ICU, Cath lab, endoscopy room or non-critical areas like general wards or OPD) due to which they may not be fully aware about safety protocols of the hospital [9].

There is extensive literature on knowledge, risks and safety of health care workers with respect to hospital-acquired infections and needle stick injuries. However, these studies mostly focus on physicians, nurses, technicians, and paramedics. There is scanty data on KAP in sanitary workers, who form a key pillar of hospital IPC practices and may serve as a significant source of nosocomial infection [10-13]. We therefore conducted a study on IPC KAP in sanitary workers in an urban tertiary care canter in Western India, to address this lacuna in knowledge.

To the best of our knowledge, this study is one of the few such KAP studies conducted in India in this vulnerable group. Through this study we have tried to identify the lacunae in sanitation workers' IPC knowledge, discern their attitude towards their jobs, and obtain an outlook into their frame of mind and perceptions regarding infection control practices. This information will allow hospitals to modify induction programs undergone by sanitation workers on recruitment, adjust the frequency of re-trainings, and suggest improvements in resource allocation and support systems for sanitation workers.

MATERIAL AND METHODS

1. Study setting- Study was conducted in a tertiary care teaching hospital Pune, urban area of western India.
2. Study design- Cross-sectional descriptive study
3. Study duration- 2 months (1 January 2024 – 29 February 2024)
4. Study population and sample size –
   Sample size estimation was done using prevalence as 93.3% from reference article. [14]. Allowable error is 4.66%, sample size was calculated as given below
   sample size(n)= Z^2x p(100-p) / d^2
   Z= z-score (1.96)
   P=standard deviation (93.3%)
   d=margin of error (4.66%)
   Sample size came as 111
   In our hospital, total 500 sanitary workers are on the roaster,so those who consented to take part in study were involved. 405 sanitary workers included in study.
5. Study methodology– A close-ended, self-administered questionnaire via google forms and printed hard copy was used to assess knowledge, attitudes, and practices toward infection control measures. The questionnaire was prepared through literature review, including CDC and WHO guidelines, and comprised 5 questions each for knowledge, attitude and practice.
6. Prior to starting the questionnaire, an introduction outlined the study's purpose, consent criteria (voluntary participation, confidentiality, anonymity), and provided contact details for the principal investigator and Institutional Review Board (IRB) for inquiries or withdrawal.
7. The English questionnaire was translated to Marathi and back-translated for consistency and validity.
8. Those google forms and hard copies were circulated among all sanitation workers and their responses analysed. The questionnaire was available in English as well as in Marathi. The data was collected over shifts to increase the representativeness of the sample.
9. Questionnaire-

Question for assessing Knowledge

1.Gloves should be worn while operating in contact with blood and body fluids and other samples
   a) always
   b) never
   c) only the patient is a known case of infectious disease
   d) not sure

2.Diseases transmitted by Needle stick Injury
   a) HCV
   b) HIV
   c) HBV
   d) all of the above

3.Sharps containers must be removed when they are –
   a) half full
   b) ¾ full
   c) can be filled till the top
   d) 1/3rd full

4. A spill management kit should contain
   a) Silica
   b) x ray film
   c) Duster
   d) all of the above

5. Bacillol spray is used for-
   a) surface disinfection
   b) antiseptic
   c) disinfection of sputum specimen
   d) none of the above

Question for assessing Attitude

1	Do you think work load affects your ability to follow infection control guidelines	Agree/ Neutral/Disagree
2	Do you thing reporting a needle stick injury can help in its prevention or is useful	Agree/ Neutral/Disagree
3	Do you thing disposal in colour coded bags is beneficial or is tedious and time-consuming practice	Agree/ Neutral/Disagree
4	Do you think wearing a mask is beneficial	Agree/ Neutral/Disagree
5	Do you think performing hand hygiene is required after wearing gloves	Agree/ Neutral/Disagree

Question for assessing Practices

1	Do you dispose waste according to colour coding	Yes/No
2	Have you been vaccinated against Hepatitis B	Yes/No
3	Do you wash your hands after removing gloves	Yes/No
4	Have you ever had a needle stick injury	Yes/No
5	Do you use gloves while handling patient samples	Yes/No

The scoring system for knowledge, attitudes, and practices regarding infection control measures was according to the scales [18]:

Good knowledge and practice: earning a score above 50%

Poor knowledge and practice: earning a score below 50%

Positive attitude: study participants who responded above 50%

Negative attitude: study participants who responded below 50% [15]

10. Data analysis -The collected data was entered in spread sheet and analysed using excel 2021
11. Ethical considerations- Institutional Ethics Committee Approval was obtained before beginning the study, study procedure was explained to the participants and informed consent was taken from them. The respondents were assured that their confidentiality will be maintained and ethical principles will be followed.

RESULTS & DISCUSSION

Total 405 participants in the study answered the questionnaire. Questions were prepared considering the job profile of sanitary workers. Topics included were hand hygiene, use of personal protective equipment's, occupational hazards and biomedical waste management. 233 sanitary workers scored above 50% while 172 secured below 50% scores. 1 point was allotted to each correct answer and 0 points to an incorrect response.

Sr. No	Questions regarding knowledge	Answered correct (%)	Not answered correct (%)
1	Gloves should be worn while operating in contact with blood and body fluids and other samples	95.3	4.7
2	Diseases transmitted by Needle stick injury	66.7	33.3
3	Sharps containers must be removed when they are filled up to 75%	81.7	18.3
4	Spill management kit should contain	62	38
5	Bacillol spray is used for	64.7	35.3

95.3% are aware that gloves should be worn while handling patient's specimens during discarding or transportation, which is satisfactory. Though,81.7% knew that puncture proof sharp containers must be removed when filled up to $3/4^{th}$, only 66.7% could answer correctly about diseases transmitted through needle stick injury. 62% workers had adequate knowledge on spill management and 64.7% had knowledge on the correct use of disinfectants. This clearly highlights the knowledge gaps among sanitation workers on infection control practices, and identifies scope for improvement.

Table 2 Attitude of sanitary workers

Sr. No	Question regarding attitude	Agree %	Disagree %	Neutral %
1	Do you think work load affects your ability to follow infection control guidelines	61	34.8	4.2
2	Do you think reporting a needle stick injury can help in its prevention or is useful	90.2	4.9	4.9
3	Do you think disposal in colour coded bags is time-consuming practice	42.4	53.6	4
4	Do you think wearing a mask is beneficial	99	0	1
5	Do you think performing hand hygiene is required after wearing gloves	96.5	1.3	2.2

99% sanitary workers believe that Wearing mask is beneficial but when it comes to discarding waste only 54% agreed that it's not time consuming. 61% do feel that because of workload they are not able to follow all protocols of infection control practices.

Table -3 Practices by sanitary workers

Sr. No	Questions on Practice	Answered yes %	Answered No%
1	Do you dispose waste as per colour coding	98	2
2	Have you been vaccinated against Hepatitis B	96.5	3.5
3	Do you wash your hands after removing gloves	98.8	1.2
4	Have you ever had needle stick injury	10.6	89.4
5	Do you use gloves and mask while handling patients' samples	97.5	2.5

3.5% unimmunised workers are at maximum risk for infections during needle stick injury and 10.6% workers have had needle stick injury till date. It is important to note that none of these NSIs took place during their employment in our hospital, which demonstrates the importance of sensitization on NSI.

Our study found that 98% sanitary workers are following biomedical waste segregation properly. But the 2% who do not comply to the guidelines pose a significant threat. Repeated training at regular intervals will help in reducing this threat further. It is also equally important to instil a sense of ownership and accountability in all healthcare staff to reduce BMW disposal irregularities, since we found that 42.5 % workers find waste disposal as per colour coding time consuming. The study also shows 81.7% sanitary staff was aware that sharp container is to be filled only 75% of its capacity. But we still need to address the 20% workers who do not empty sharps containers as soon as they are $3/4^{th}$ full, since overfilled containers increase chances of needle stick injury.

96.5% sanitary workers are immunized for hepatitis B. This proved helpful in protecting sanitary workers from infection when exposed, as in our study 10.6% participants have faced Needle stick injury and none of them got infected with HIV, HCV or HBV. There was shortage of vaccination vials from May 2023,so that could be reason for those 3.5% who did not take vaccination. Harshal et al in their study done at teaching hospital in Pune in year 2022 reported 100% Hepatitis B immunization as well as biomedical waste segregation which is really commendable and we, at our hospital will try to achieve [16]. 'Soyam et al."; in their 2017 Delhi study reported 64.5% immunization, which is less as compared to our study [17].

98.8% sanitary workers always wash hands after removal of gloves and 73.3% strongly believe that Hand hygiene is a key point in infection prevention, necessitating hygiene even on gloved hands. Celebration of hand hygiene week, arranging lectures and different competitions like rangoli (pattern) making, poster preparation have really increased awareness among sanitary workers.

97.5 % workers use gloves and mask while handling patients' samples, and 98.8% sanitary workers believe that wearing mask is beneficial to avoid getting infected. Being sanitary workers, their job profile includes cleaning, disinfection of wall surfaces and mounted equipments in wards, ICU, and labs. Along with this, they also transport samples to laboratories, transfer patients to various locations and wards, and handle biomedical waste and its transport to the central facility. During all these activities there are chances of spillage, injuries from sharps, exposure to infected specimens, as well as close contact with infected patients.95.2% sanitary workers have knowledge about standard precautions to be followed while performing all the work listed above. 70.1% sanitary workers feel that heavy workload affects their ability to follow infection control guidelines and this could be possible reason for not achieving 100% compliance in infection control practices. Moreover, sanitary workers are mostly appointed through outsourced agencies, and working hours are decided by these agencies. On joining the health facility, all workers receive training on housekeeping activities and infection control practices. Along with induction training, regular need-based training and refresher course are usually given to all sanitary workers.62% sanitary workers answered correctly about the content of the spill manage kit.38% who fail to answer in whole about spill management kit require targeted training focused on spill management. Sanitary workers solely managing spill incidences have to remain updated on institutional guidelines for spill management, else these spills will expose of the entire surrounding area infections.

Every sanitary worker is regularly trained about cleaning and disinfection. They are taught about the detailed procedure and the chemicals to be used cleaning and disinfection. 64.7% were able to correctly answer Bacillol spray being used for heat sensitive instruments. This result is worrisome as sanitary workers need to be aware of the correct disinfectant to avoid damage to equipment.

Study donein 2018 by Sanjay G et al at teaching hospital in Pimpri reported that gloves are used by 96% sanitary workers after training on handling biomedical waste and are 79.48% immunized for Hepatitis B, but it was found that 60.25% of workers suffered from NSI and 19.23% with cuts from sharp objects [18].

Degavi G et al, (2021) conducted a study to assess knowledge, attitude, and practice and associated factors regarding prevention of occupational risks and health hazards among sanitary workers in Ethiopia. It was found that 64% of participants had good knowledge of the prevention of occupational health risks. About 76.4% of solid waste collectors had a good attitude but only 8.9% showed good practice regarding prevention of occupational health hazards [19].

The present study was carried out in a single tertiary care teaching hospital in a West Indian city. It

highlights lacunae in the existing IPC framework and provides useful insight for designing training programmes in future. Such surveys should be undertaken by all healthcare set-ups across the country to identify and address gaps, enhance IPC practices and prevent nosocomial infections.

CONCLUSION

Accurate knowledge is associated with full compliance and positive attitudes in healthcare set-up.Though almost 58% proportion of sanitary workers held positive attitudes and had good knowledge, and compliance with practices but 42% is still a big obstacle to achieve. Better training coverage with newer training methods may result in 100% compliance in practices with positive attitude.

ETHICS APPROVAL

Institutional Ethics Committee Approval obtained before study. Certificate number BVDUMC/IEC/30 Date-15/04/2023

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DECLARATION OF COMPETING INTREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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