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Bridging the gap: Analyzing discrepancies in knowledge, attitude, and practice of infection control among healthcare workers

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ABSTRACT

Introduction: Over the past decade, Hospital-acquired infections (HAIs) have become a significant concern within Indian Tertiary Healthcare Centers. The effectiveness of infection control practices heavily relies on the diligence of healthcare workers, directly impacting the success of these measures. It's crucial to closely examine any disparities between ideal and actual practices to ensure optimal infection control outcomes.

Objectives: To find any gap between ideal and actual infection control practices and analyze associated factors which is actually responsible for the that gap.

Materials and Methods: A cross-sectional study was carried out at a tertiary healthcare center in north Gujarat over six months, spanning from February 2023 to July 2023. The study included a total of 293 participants, comprising 61 doctors, 154 nurses, 33 paramedical staff, and 45 housekeeping staff. Data were collected using a pretested, structured, self-administered questionnaire covering different aspects of infection control practices. Knowledge, attitude, and practice (KAP)Scores of 70% or less were considered below average, scores between 71 and 80% average, 81 to 90% good and above 90% were very good.

Result: KAP score is 98.8% in knowledge, 88.70% in attitude and 89% in self-reported practices. Cumulative KAP score was 92.16% which is under very good category. Around 88.52% (54 out of 61) of doctors, 69.48% (107 out of 154) of nurses, 78.78% (26 out of 33) of paramedical staff, 64.44% (29 out of 45) of housekeeping staff scored above 90% in KAP score which is under very good category.

Conclusion: Regular training, post training assessments and strict enforcement of infection control measures in hospitals can help to fill gaps in the knowledge, attitudes, and self-reported practices of healthcare workers regarding infection control.

1. Introduction

Infection control practices are fundamental in healthcare settings to prevent the spread of diseases and protect both patients and healthcare workers (HCWs). Hospital-acquired infections, also known as healthcare-associated infections (HAI), are nosocomially acquired infections that are typically not present or might be incubating at the time of admission. These infections are usually acquired after hospitalization and manifest 48 hours after admission to the hospital.[1] Hospital acquired infections (HAIs) are great concern since a last decade in Indian Tertiary Healthcare Centers. HAIs are the common adverse events in the health care centers which significantly affect morbidity, mortality and duration of the stay in the hospital for indoor patients. There are various evidence-based guidelines available to guide healthcare professionals in implementing effective

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infection control measures.[2]

The prevalence of Healthcare-Associated Infections (HAIs) tends to be higher in developing countries among hospitalized patients. This variance in prevalence rates underscores the critical role of infection control practices implemented by healthcare professionals within their respective workplaces.[3] Health care workers (HCWs) undergo extensive training on infection control measures during their education and professional development. They learn about hand hygiene, personal protective equipment (PPE) use, disinfection procedures, and isolation protocols, etc. However, despite developing these protocols for Infection control program, HCWs may struggle to follow it in real-world clinical settings. May studies have found the gap in infection control practices often stems from discrepancies in knowledge, attitude, and practice. While many HCWs possess theoretical knowledge about infection control protocols, translating this knowledge into consistent and effective practice can be challenging. Factors such as workload, time constraints, organizational culture, and inadequate resources contribute to this gap.[4]

Preventing hospital-acquired infections requires a multifaceted approach that addresses various layers of healthcare delivery. Effective implementation of these measures can have ripple effects, positively influencing other aspects of healthcare services. The success of infection control practices hinges largely on the dedication and diligence of healthcare workers, significantly impacting the overall outcomes. In addition to ensuring healthcare workers possess the necessary skills and knowledge, it's crucial to acknowledge and address factors that may influence their adherence to infection control protocols. Any disparities between ideal and actual practices should be promptly identified and analyzed as part of hospital protocols to drive continuous improvement.[5]

2. Objectives

1. Primary objective of this study to find any gap between ideal and actual infection control practices in our tertiary healthcare centre.
2. Secondary objective of this study is to analyze associated factors which is actually responsible for the gap in infection control practices.

3. Materials and Methods

3.1. Study design

1. Cross-sectional design was employed in 550 bed tertiary care centre (Nootan Medical College & Research Centre) in North Gujarat region to assess the knowledge, attitude, and practice of infection control among healthcare workers.
2. A mixed-methods approach combining quantitative surveys and qualitative interviews was applied to receive comprehensive understanding of the factors contributing to gaps in infection control practices.

3.2. Study duration

1. The data for this study were collected over a span of six months, starting from February 2023 to end of July 2023.
2. Criteria for enrolment in the study
3. Inclusion criteria- All healthcare professionals engaged in infections control practices over 3 month period in this institution were eligible for enrollment.
4. Exclusion criteria- Any staff not willing to participate in the study.

3.3. Sampling

1. Random sampling techniques was used to select a representative sample of healthcare workers from different departments or units within healthcare facilities.
2. Sample size was 293 in this study, out of them 61 were doctors, 154 were nurses,33 were paramedical staff and 45 were housekeeping staff.

3.4. Data collection

1. Demographic details including age, sex, work experience, and no of infection control training were collected and the identities of the study participants were kept anonymous to ensure that they could respond candidly without concerns about potential professional repercussions.
2. We developed a structured questionnaire form after reviewing published literature for relevant items to assess healthcare workers' knowledge & attitude concerning infection control protocols, including hand hygiene, PPE use, isolation precautions, and disinfection and cleaning based on their area of practice. Information and suggestions about perceived importance, barriers, and motivators regarding the daily practices were collected in same way.[6–8]

3.5. Data analysis

1. Variables and score for individual participant was entered in Microsoft excel 2016 and analysis was done by Epi-info software version 7.2. Categorical variables were expressed in terms of frequency and percentage. Cumulative scores were decided for each domain out of 10. In assessing the knowledge, attitude and practice, a score of 70% or less were considered below average, scores between 71 and 80% average, 81 to 90% good and above 90% were very good. The scoring system is based on a study done by Uba et al (2015).[9]

2. Triangulate quantitative and qualitative analysis was done to gain a comprehensive understanding of the factors contributing to gaps in infection control practices among healthcare workers. Also knowledge, attitude, and practice scores were compared to identify discrepancies and areas for improvement.

3.6. Ethical considerations

1. This study was conducted after the approval form institutional ethics committee (IEC/NMCRC/Approval/20/2023). The participants were informed that participation was voluntary, that they could withdraw from the study at any time, and that confidentiality would be maintained throughout.

4. Results

The study reflects the current level of the knowledge, attitudes and the self-reported practices among Health Care Workers. Total of 315 questionnaires were distributed out of which 293 were retrieved, 22 did not respond giving a response rate of 93.01%. Of the 293 responders, 61 were doctors, 154 were nurses, 33 were paramedical staff and 45 were housekeeping staff.

The study population has a median age of 30 years for doctors, 31 years for nurses,30 for paramedical staff and 34 for housekeeping staff. Median Years of experience for doctors is 9 years, for nurses is 7 years, for paramedical staff is 7 years and for housekeeping staff is 9 years. In study population 98.36% doctors, 98.05% nurses, 96.96% paramedical staff and 80% housekeeping staff had taken infection control training.

In this study we were kept total 10 questions on knowledge, 10 questions on attitude and 10 questions on self-reported practices. So, here we gave equal weight age to all three aspects. In this study mean cumulative KAP score was 27.65 out of total 30 score. Minimum score in knowledge section was 8 and 7 in both attitude and practice sections. Specifically, the sample scored very good, i.e. 9.88 correct responses out of 10 questions (98.8%) in knowledge, 8.87 correct responses out of 10 (88.70%), i.e. good in attitude and, 8.90 out of 10 (89%), i.e. good in self-reported practices. In percentage cumulative KAP score was 92.16% which is under very good category.[9]

In assessing the knowledge, attitude and practice, a score of 70% or less were considered below average, scores between 71 and 80% average, 81 to 90% good and above 90% were very good. The scoring system is based on a study done by Uba et al(2015).[9] scored above 90% in KAP score category respectively. Nurses around scored above 90% incategoryevident that around 78.78% (26 out of 33) of paramedical staff scored above 90% in KAP score House keeping staff scored above 90% in KAP score House keeping staff scored between 81 to 90% which is under very good and good category respectively.

5. Discussion

Transmission of infections within hospital premises between healthcare providers and their patients typically occurs due to noncompliance in infection control protocols. To curtail this, there is need to educate healthcare givers on infection control measures, however, this can only be achieved by understanding the gaps in knowledge, attitude and self-reported practices of infection control among healthcare givers. In this study total of 315 questionnaires were distributed out of which 293 were retrieved, 22 did not respond giving a response rate of 93.01% which is comparable with study of Ginny Kaushal et al(85%).[10] Median years of experience for doctors years, for years, for was house keeping staff was 9 years which shows majority of health care workers in our study were not novices in their profession.[11]

Mean score was 9.88 in knowledge, 8.87 in attitude and 8.90 in self-reported practices in our study. Cumulative KAP score in knowledge is 98.8%, in attitude is 88.70% and in practices is 89%, which indicate that good knowledge does not always translate into good attitude and practices. This has also been shown in a previous study of Adinma ED, et al in Nigeria[12]

Additional factors may also confound the prediction of effective infection control practices. Insufficient resources, increased workload, and time limitations have all been cited as significant influencers contributing to subpar infection control practices in healthcare settings.[12–14]

In our premises different factors have been found to affect the daily infection control practices. While knowledge of basics of infection control measures found be excellent but transcribing into practice was little bit challenge for many of the participants. Main factors contributed was lack of resources e.g. unavailability/ decreased supply of required items of daily use e.g. hand rub, sterile gloves, surface disinfectant, bmw dustbin etc. After then limited human resources as compared to workload was found another reason to fulfil the goal of infection control measures. Much scattered feedback were received like individual forgot what they learned during training, skin irritation while using hand rub, wrong method for use of PPEs, absence in training sessions, etc. The identified gaps in knowledge, attitude and practice in this study despite regular training, is alarming. Closing the gap in knowledge, attitude, and practices is essential, as it represents the most crucial method for preventing Healthcare-Associated Infections (HCAIs).[15]

In this study, around 88.52% (54 out of 61) of doctors, 69.48% (107 out of 154) of Nurses, 78.78% (26 out of 33) of paramedical staff, 64.44% (29 out of 45) of Housekeeping staff scored above 90% in KAP score which is under very good category. HCWs with

Table 1: Demographic details of the respondents

	Doctors (n=61)	Nurses (n=154)	paramedical staff (n=33)	housekeeping staff (n=45)
Male	31	66	14	10
Female	30	88	19	35
Median age (in years)	38	31	30	34
Median years of experience	9	7	7	9
Infection control training	60(98.36%)	151(98.05%)	32(96.96%)	36(80%)

Table 2: Cumulativeknowledge, attitude, practice (KAP) scores

Parameters	Knowledge	Attitude	Practice	Cumulative KAP score
No. of questions	10	10	10	30
Mean score for the respondents	9.88	8.87	8.90	27.65
Percentage	98.8	88.70	89	92.16
Maximum	10	10	10	30
Minimum	8	7	7	22

Table 3: Category according to cumulative KAP score

Category	KAP Score	Doctor (n=61)	Nurses (n=154)	Paramedical staff (n=33)	Housekeeping staff (n=45)
Below average	70% or less	1(1.63%)	4(2.59%)	1(3.03%)	3(6.66%)
Average	71 and 80%	1(1.63%)	12(7.79%)	2((6.06%)	7(15.55%)
Good	81 to 90%	5(8.19%)	31(20.12%)	4(12.12%)	6(13.33%)
Very good	above 90%	54(88.52%)	107(69.48%)	26(78.78%)	29(64.44%)

higher educational achievement were more likely, probably owing to these capabilities of HCWs to find the right source of information, such as published research and good training programs. Doctors generally receive more extensive training in infection control during their medical education and ongoing professional development. This extensive training often results in higher knowledge scores among doctors compared to other health care workers.[16] Attitudes towards infection control can be influenced by the perceived importance of these practices. Studies suggest that doctors often demonstrate a more proactive attitude towards infection control, viewing it as critical to patient safety and clinical outcomes. Nurses, while also recognizing its importance, may face barriers such as workload and time constraints that can negatively impact their attitudes. Despite having good knowledge and positive attitudes, actual infection control practices may vary. Doctors often have better compliance with infection control protocols due to their leadership roles and the responsibility to set an example. However, other health care workers are typically more involved in direct patient care, increasing their exposure and risk, which might not always align with perfect adherence to protocols due to practical challenges. The quarterly mandatory training embarked upon by the hospital infection control committee would likely explain the overall good knowledge, attitude and practices shown in this study. A similar pattern has been previously reported in Nigeria.[12] Studies elsewhere also showed that training improves knowledge and compliance with standard precaution.[17–19] In another study among health workers in a Tertiary Hospital in North-Eastern Nigeria, training on standard precautions was predictive of correct knowledge of standard precaution.[20]

6. Implications

Even with regular infection control training in the hospital, gaps have been identified in knowledge, attitude and self-reported practices of infection control among Health Care Workers. This emphasizes the necessity for ongoing refresher training and measures to enforce the implementation of infection control protocols within the hospital. Healthcare organizations can evaluate post training impact on knowledge, attitude and practices of Health Care Workers.

7. Source of Funding

None.

8. Conflict of Interest

None.

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