



A Study on Total Quality Management (TQM) in Infection Prevention Control (IPC) Practices of Nurses in Government General Hospital Vijayawada

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Abstract: Background: The frequency of healthcare-associated infections (HAIs), which can affect up to 15% of hospitalized patients and 9%-37% of patients referred to intensive care units (ICUs), is a significant issue for the healthcare system.¹ Healthcare organizations must prioritize HAI prevention.²⁻⁵ Effective infection prevention and control (IPC) depends on healthcare workers knowledge of infection control (IC) practices, and poor knowledge and awareness among HCWs have been associated to deteriorating healthcare delivery results. **Objectives:** To assess the knowledge, attitude and practices of infection control practices followed by nurses in their day to day procedures in Government General Hospital Vijayawada. **Material & Methods:** Study Design: A prospective hospital based descriptive study. Study area: Government general Hospital Vijayawada. Study Period: February 2023 – July 2023. (6 months) Study population: Staff nurses who are working in all wards of Government General Hospital Vijayawada. Sample size: The study consisted of 91 subjects. Sampling method: Simple random technique. Study tools and Data collection procedure: A direct method approach was employed, consisting of a cross-sectional survey through questionnaire in Google sheets. The survey questionnaire was distributed among a representative sample of nurses across various departments within the hospital. The survey encompassed questions related to knowledge of IPC guidelines, hand hygiene practices, personal protective equipment (PPE) utilization, environmental cleaning routines, and perceptions of organizational support for IPC. **Results:** With regard to indications for hand rub, 51.6 % staff nurses opted and agreed that when your hands are not visibly soiled which is the correct answer and 27.5 % answered instead of traditional handwashing (20 sec) ,16.5% answered that instead of surgical hand washing (3min), remaining 4.4% answered when your hands are visibly soiled. Overall KAP status of the study population was excellent in 53.8%. 46.2% of the study population were having good KAP status. No subjects were in the group of average or poor KAP status. **Conclusion:** The largest difficulty in any hospital is infection prevention and control, and nurses' knowledge and understanding of this topic must be improved if it is to be successful. To increase understanding and compliance with IC practices, a multimodal strategy should be used, including training, feedback, and ongoing education programmes.

Keywords: healthcare-associated infections (HAIs), Infection Prevention Control (IPC), surgical hand washing, specific practices (SP).

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INTRODUCTION

The frequency of healthcare-associated infections (HAIs), which can affect up to 15% of hospitalized patients and 9%-37% of patients referred to intensive care units (ICUs), is a significant issue for the healthcare system.¹ Healthcare organizations must prioritize HAI prevention.²⁻⁵ Effective infection prevention and control (IPC) depends on healthcare workers knowledge of infection control (IC) practices, and poor knowledge and awareness among HCWs have been associated to deteriorating healthcare delivery results.⁶ Thus, it is crucial to continuously refresh nurses' knowledge through continuing in-service educational programmes that include an emphasis on the most recent IPC evidence-based practices.

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Hospital acquired infections (HAI) are a significant global health and safety risk for both patients and medical staff. Many factors, including "decreased resistance among patients," "increasing variation of medical procedures," and "invasive techniques crafting potential routes of infection," as well as "the transmission of drug-resistant bacteria" are concentrated among hospital populations, where subpar infection control practices may facilitate transmission, stimulate infections among hospitalized patients. Despite improvements in hospital treatment and community/public health, infections continue to spread among hospitalized patients and may even harm hospital employees.

IPC need to be a standard feature of every healthcare facility because it not only safeguards the wellbeing of patients but also that of medical staff. The WHO has published guidelines on essential elements of IPC activities at the national and acute health care facility level in an effort to strengthen the IPC.^{7,8} Infection control is a discipline that focuses on preventing infections that are related to healthcare settings. It is essential, but is sometimes underfunded and underappreciated as a component of how healthcare is organized.

One of the most likely places to contract an infection is in a hospital because of the large population of microorganisms there, some of which are antibiotic-resistant and can cause hospital acquired diseases. This study was deemed important in order to take action, gain understanding of the issue of healthcare-associated disease and limitations brought about by insufficient infection control procedures, and come up with a suitable solution for the occupational safety of the workers. Thus, the emphasis is on enhancing clinical services and the health of both patients and healthcare professionals. The findings of this study can be used as guidelines to establish and enhance hospital infection control services already in place, as well as to create new ones and provide exceptional services.

OBJECTIVES: To assess the knowledge, attitude and practices of infection control practices followed by nurses in their day to day procedures in Government General Hospital Vijayawada.

MATERIAL & METHODS:

Study Design: A prospective hospital based descriptive study.

Study area: Government General Hospital Vijayawada.

Study Period: February 2023 – July 2023. (6 months)

Study population: Staff nurses who are working in all wards of Government General Hospital Vijayawada.

Sample size: The study consisted of 91 cases.

Sampling method: Simple random technique.

Inclusion criteria:

1. Staff nurses who are working in all wards of Government General Hospital Vijayawada.
2. Those who wanted to give consent and to participate in the study.

Exclusion criteria:

1. Those who does not give consent.
2. Those who did not responded to the questionnaire.

Study tools and Data collection procedure:

A direct method approach was employed, consisting of a cross-sectional survey through questionnaire in Google sheets. The survey questionnaire was distributed among a representative sample of nurses across various departments within the hospital. The survey encompassed questions related to knowledge of IPC guidelines, hand hygiene practices, personal protective equipment (PPE) utilization, environmental cleaning routines, and perceptions of organizational support for IPC.

Statistical analysis:

Data were descriptively analyzed using mean and standard deviation for continuous data and frequency and percentage for categorical data. Categorical data were presented using frequency and percentage. Statistical analyses were performed using SPSS 20.0 (the statistical package for social sciences) IBM Corp.

OBSERVATIONS & RESULTS:

Table 1: Designation of the study population

Designation	No.	Percentage (%)
Staff Nurse	65	71.4
Nursing Officers	12	13.2
Infection control nurse	1	1.1
Head Nurse	4	4.4

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GNM	8	8.8
Hospital Administrator	1	1.1
Total	91	100

In our study most of the subjects i.e 71.4% were staff nurses, followed by nursing officers i.e 13.2%. GNMs were 8.8% and head nurses were 4.4%.

In our study 94.5% subjects were females and 5.5% were males.

Table 2: Experience

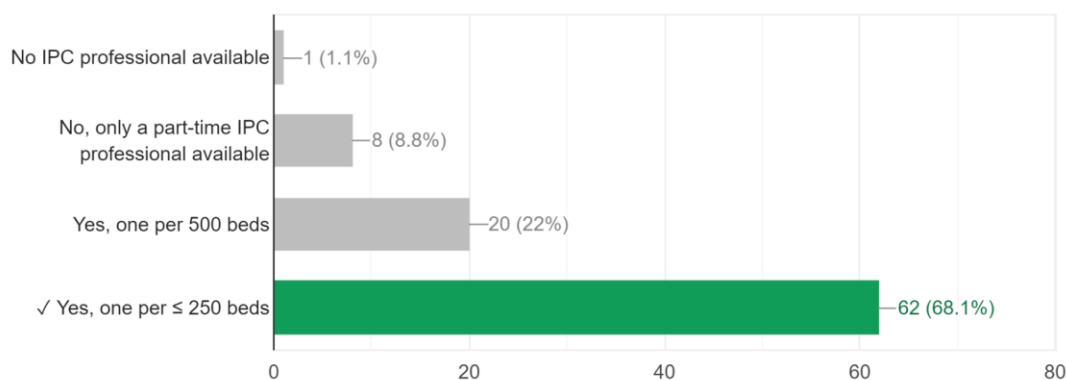
Experience (in years)	No.	Percentage (%)
0 – 10	48	52.7
11 – 20	32	35.2
>20	11	12.1
Total	91	100

Majority of the study subjects i.e 52.7% had an experience of 0 – 10 years followed by 35.2% had 11 – 20 years of experience. Only 12.1 % of study subjects were having > 20 years of experience of their work.

Figure 1:

1. The IPC team consists of how many full-time Infection Control Nurse(ICN) working in your Hospital? Do you think available number of ICN me...C norms according to your Hospital Bed strength?

62 / 91 correct responses



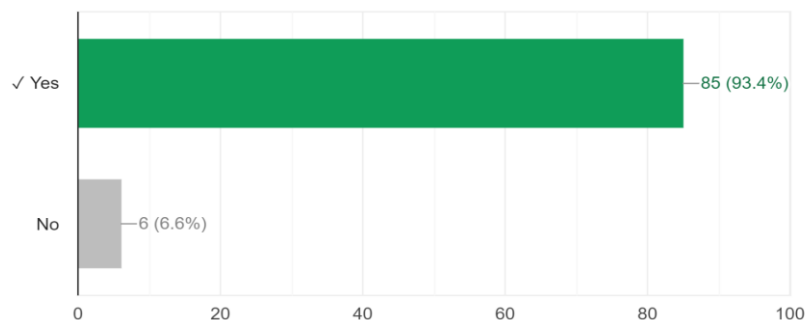
62 % staff nurses opted and agreed that one ICN per 250 beds should be there and available which is the correct answer as per IPC norms in their hospital and 20 % opined that one per 500 beds are available, remaining 8 % and 1% felt that only part time ICN and NO ICN available at all in the hospital.

100% staff nurses opted and answered yes, for the question “Does your facility have IPC guidelines?”. 100% staff nurses opted and answered yes, for the question “DO YOU FOLLOW HAND HYGIENE PRACTICES?”. 100% staff nurses opted and answered yes, for the question “Do you follow Disinfection and sterilization practices?”. 100% staff nurses opted and answered yes, for the question “Do you follow biomedical waste management practices?”. 95.6% staff nurses opted yes and remaining 4.4% opted NO for the question “Do you think adequate microbiology and laboratory resources help in surveillance of HAI’s?”.

Figure 2:

5. Do you follow care bundles - SSI, CABS, VAP, UTI ?

85 / 91 correct responses

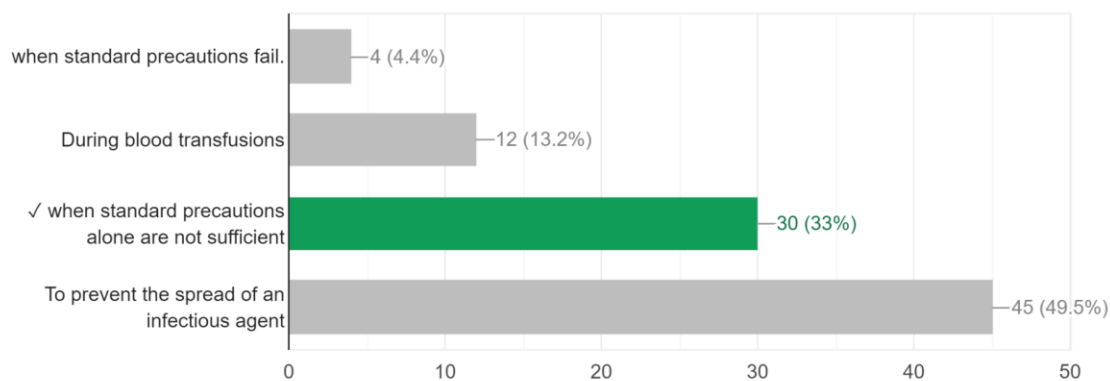


85 % staff nurses opted yes, 6.6% staff nurses opted NO.

Figure 3:

8. When do you follow Transmission based precautions ?

30 / 91 correct responses

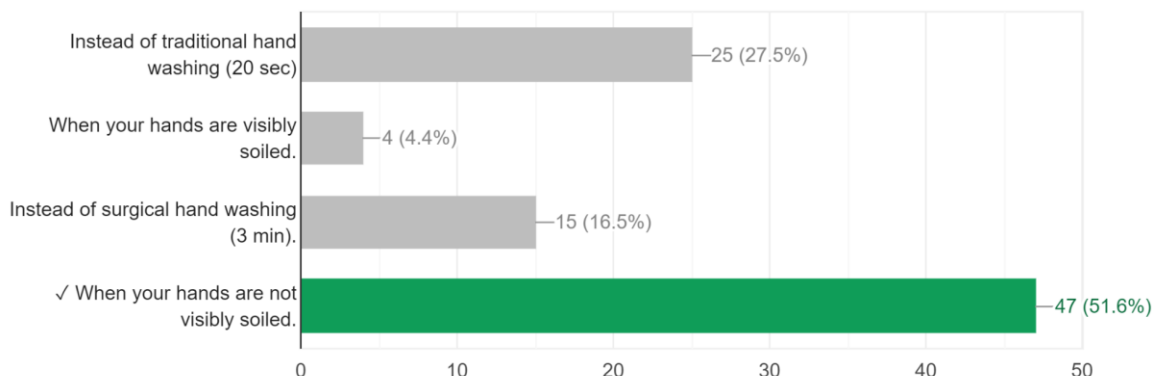


33% staff nurses opted and agreed that when standard precautions alone are not sufficient which is the correct answer and 45% answered to prevent the spread of an infectious agent, 12% answered that during blood transfusions, remaining 4% answered when standard precautions fail.

Figure 4:

9.What are the indications for the use of Alcohol based hand Rub ?

47 / 91 correct responses

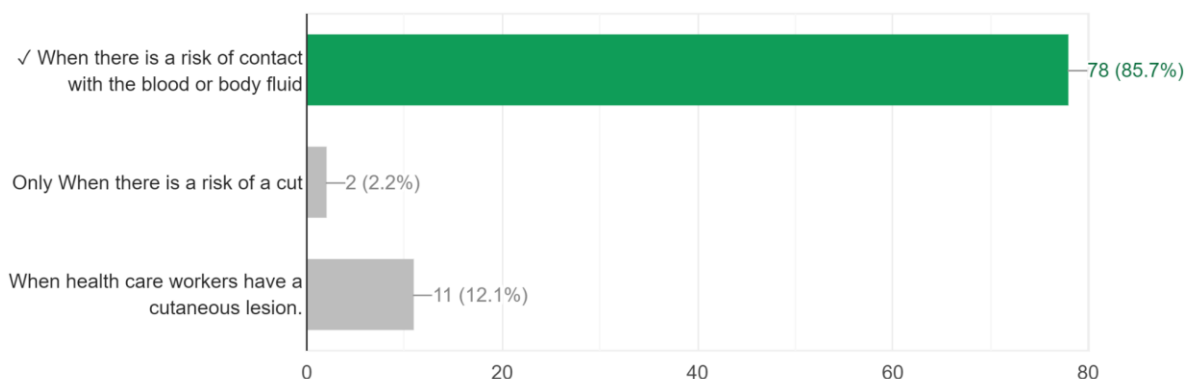


51.6 % staff nurses opted and agreed that when your hands are not visibly soiled which is the correct answer and 27.5 % answered instead of traditional handwashing (20 sec) ,16.5% answered that instead of surgical hand washing (3min), remaining 4.4% answered when your hands are visibly soiled.

Figure 5:

10.The standard precautions recommend use of gloves.

78 / 91 correct responses

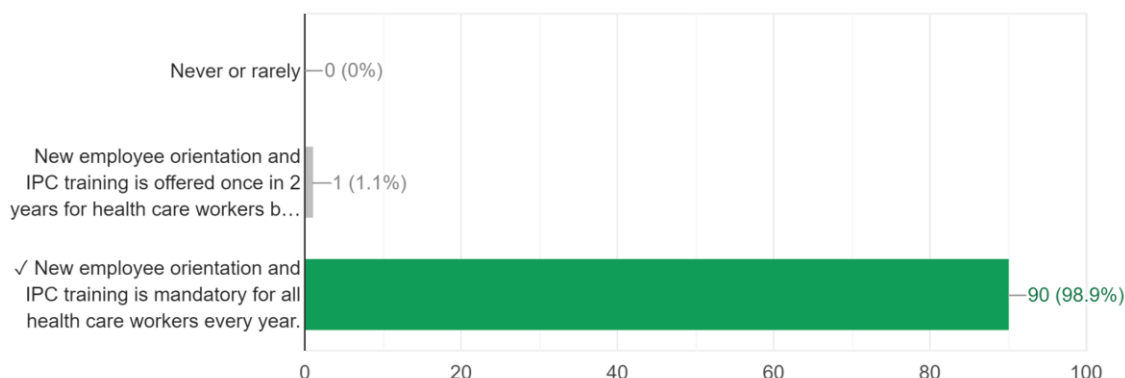


85.7 % staff nurses opted and agreed that when there is a risk of contact with blood and body fluids which is the correct answer and 12.1 % answered when health care workers have a cutaneous lesion, remaining 2.2% answered only when there is a risk of cut.

Figure 6:

11. How frequently do you think health care workers need training regarding IPC practices?

90 / 91 correct responses

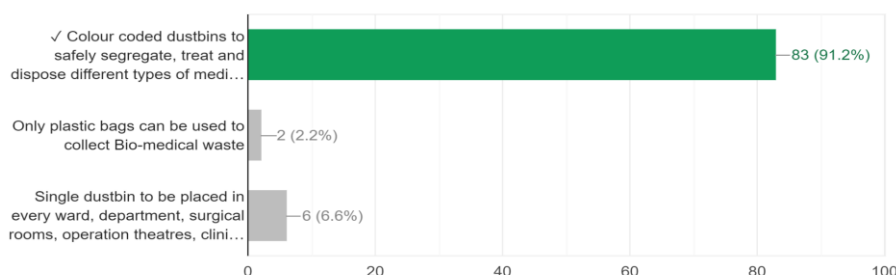


98.9 % staff nurses opted and agreed that new employee orientation and IPC training is mandatory for all health care workers every year. which is the correct answer and remaining 1.1 % answered when New employee orientation and IPC training is offered once in 2 years for health care workers but not mandatory.

Figure 7:

14. Biomedical waste management disposal.

83 / 91 correct responses



62 % staff nurses opted and agreed that Colour coded dustbins to safely segregate, treat and dispose different types of medical waste according to the level of harm and threat it might pose to the environment. Which is the correct answer as per IPC norms in their hospital and 6.6 % opined that Single dustbin to be placed in every ward, department, surgical rooms, operation theatres, clinics, consultation rooms etc, remaining 2.2 % opted that only plastic bags can be used to collect biomedical waste.

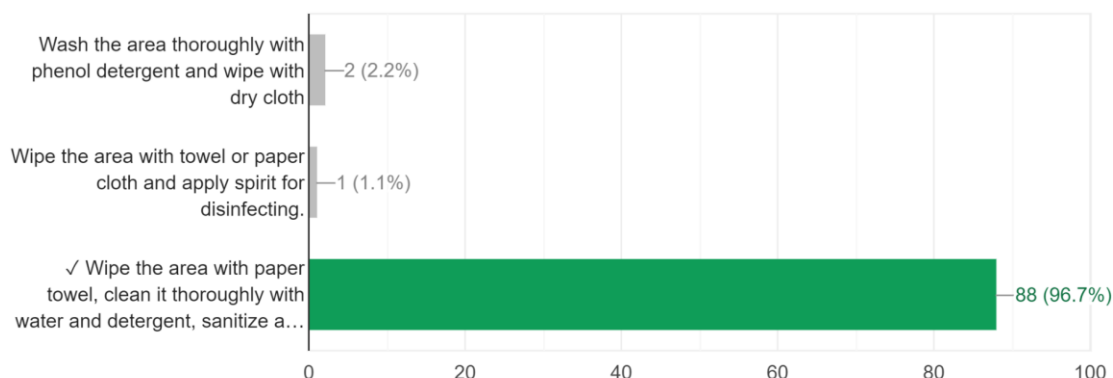
78% staff nurses opted yes and remaining 22% opted NO for the question “Does an incinerator or alternative treatment technology for the treatment of infectious and sharp waste (for example, an autoclave) can be used for disinfection before disposal?”.

100% staff nurses opted triple bucket system –washing, rinsing, sanitizing, for the question “Which method to be followed for Environmental cleaning and disinfection while cleaning hospital floors, rooms and wards.”

Figure 8:

17.How to disinfect a blood or body fluid spillage site.

88 / 91 correct responses



96.7 % staff nurses opted and agreed that Wipe the area with paper towel, clean it thoroughly with water and detergent, sanitize area with sodium hypochlorite 0.5% as disinfecting agent and dry it with paper towel which is the correct answer and remaining 2.2 % answered wash the area thoroughly with phenol detergent and wipe with dry cloth, 1.1% opted wipe the area with towel or paper cloth and apply spirit for disinfecting.

98.9 % staff nurses opted that patients require emergency immediate treatment which is the correct answer and remaining 1.1 % answered patients with minor illness, for the question “What does Red Colour in Triage indicate?”.

64.4% staff nurses opted 6 which is the correct answer 20% opted 5, and remaining 15.6% opted 9, for the question “How many patients safety goals are there to be followed?”.

Table 3: Overall KAP status in the study population

KAP status	No.	Percentage (%)
Excellent	49	53.8
Good	42	46.2
Average	0	0
Poor	0	0
Total	91	100

Overall KAP status of the study population was excellent in 53.8%. 46.2% of the study population were having good KAP status. No subjects were in the group of average or poor KAP status.

Table 4: Association between KAP status and experience

Experience	KAP status		Total
	Good	Excellent	
0 – 10	26	22	48
11 – 20	12	20	32
>20	4	7	11
Total	42	49	91

$X^2 = 2.629$, $p = 0.269$ (Not significant)

In our study there was no statistically significant association between KAP status to Experience of the work. Despite of having loads of experience for more than 20 years, remarkable percentage of Excellent, Good KAP status was not found to be there when compared to KAP status of staff nurses with experience below 20 years which highlights the need for training in specific areas of IPC Practices irrespective of experience.

DISCUSSION:

HAI is a significant issue that negatively impacts the standard of medical care.⁹ Higher hospital stays, rising healthcare expenses, financial strain on patients and their families, and higher mortality are only a few of the related negative healthcare outcomes.¹⁰ Implementing Specific practices, especially hand hygiene at every level of patient care, making sure that the essential elements of IC are in place, improving hospital-acquired pathogen surveillance, and improving staff accountability are all part of the multifaceted strategy to lower HAIs.^{11,12}

The gaps in IPC practices in Low and Middle Income Countries (LMICs) have been assessed by Arhana Angroup et.al.¹³ (2020) in order to be taken into account for strengthening the health systems for efficient operation during pandemics like Covid-19. The perspective on the basis of recent literature is presented in this study, along with recommendations for closing the gaps in the various infection prevention and control (IPC) measures currently used in LMICs. Her assessment recommended that during non-epidemic settings, infrastructure in LMICs should be in place along with training, adherence to standard protocol, and behavioral change regarding implementation of IPC practices, use of PPE, hand hygiene practice, environmental cleaning and disinfection policy among HCW's. Only then will we be capable of controlling an outbreak of this magnitude, such as the one the globe is currently dealing with. If IC practises are enhanced and maintained across developing countries in response to the continuing pandemic, it will save numerous HAIs and deaths aside from COVID-19.

To assess the effectiveness of currently advised practises for avoiding CAUTI, CLABSI, VAP, and CDI, (HAI) in the Netherlands, Anita huis et. al.¹⁴ (2020) carried out a cross-sectional survey across the country. 'Translating Healthcare-Associated Infection Prevention Research into Practise' (TRIP) questionnaire-based survey tools were used to gather data for this cross-sectional investigation. Questions on general hospital characteristics, such as the number of beds, general infection prevention policies, such as the existence of guidelines and surveillance systems, staffing of the infection control programme, and use of specific practices related to the prevention and monitoring of CAUTI, CLABSI, VAP, and CDI, were included in the instrument. The questionnaire was completed by infection prevention teams from 47 hospitals, resulting in a response rate of 65% (47/72). According to research, the majority of the infection prevention techniques used in our study significantly reduce the number of HAIs, with the exception of a few instances where antibiotic-impregnated catheters are not commonly used, CAUTI rates are not closely monitored, and VAP rates require significant improvements in the formulation of pertinent strategies to address the root cause.

In order to determine the effects of quality improvement initiatives employing the care bundle method on the rates of central-line associated bloodstream infections (CLABSI), Kalyan Chakravarthy Balla et. al.¹⁵ (2018) conducted a study. The initial three months of baseline data collection were followed by a one-year intervention phase. During the intervention period, actions were taken to improve hand cleanliness and central line bundle care. Overall mortality decreased over the intervention period, going from 2.9% to 1.7%. This study showed that CLABSI rates and blood stream infection rates could be greatly decreased by using straightforward interventions like hand cleanliness and reinforcing the care package strategy through quality improvement.

In order to give information on protocols and practices related to infection control in labour and delivery units in Gujarat state, India, Rajesh Mehta et. al.¹⁶ (2011) conducted a needs assessment. Twenty medical facilities, including reference hospitals and commercial and public primary care clinics, were chosen at random from two districts in Gujarat, India. Three previously tested interviewing and observational procedures were employed. Data collection was based on current infection control recommendations for hygienic procedures, hygienic tools, hygienic surroundings, and accessibility to diagnostics and treatment. The findings showed several lapses in IC, a lack of resources, and illogical antibiotic use. Improvements in information systems, protocols, and procedures, as well as in training and research, were found to be necessary by this study.

A study on KAP towards infection control among dentistry school prosthodontics clinic students in India was conducted by S. C. Deogade et. al.¹⁷ in 2015. In November 2015, 180 third, fourth, and fifth year dental students (119 females and 61 males) at a private dental school of Rani Durgawati University participated in a questionnaire-based study with 25 closed-ended questions about vaccination status and prior sharp injuries, awareness, knowledge, and attitude towards infection control in the prosthodontics clinic, prior education about infection control, and subjects' satisfaction with their knowledge and attitude. There were 180 individuals in all who answered the survey. Their opinions on the prosthodontics clinic's infection control procedures ranged from 14.4% to 100%. The majority of the individuals gave "good" or "fair" answers to questions assessing their understanding of and compliance with infection control procedures in prosthodontic clinics. 28.9% of people reported being only little satisfied with their knowledge and performance, while 47.8% were nearly satisfied. The study's findings revealed that the participants' attitudes and levels of awareness towards infection management in prosthodontic practice were lacking.

A cross-sectional study on the KAP of infection control practices among Indian nurses was conducted by Kanwalpreet Sodhi et. al.¹⁸ in 2021. One thousand nurses responded to an online survey using a multiple-choice format that covered 13 hospitals in India and topics such as general infection control, standard precautions, transmission-based precautions, bundle care, and awareness of COVID-19. When compared to non-teaching hospitals, nurses at certified institutions had a fair understanding of IC practices, which emphasises the value of ongoing training and education programmes.

In the study titled “Self-reported survey on infection prevention and control structures in healthcare facilities part of a national level healthcare associated infection surveillance network in India, 2019”, by Kotac et. al.¹⁹. This observation study was cross-sectional in nature. The existing Indian HAI surveillance network comprises 32 tertiary care public and private facilities. A central committee at the All India Institute of Medical Sciences in New Delhi analysed the data that had been gathered. To learn more about the ability and initiatives to implement IPC practices across hospitals, the WHO questionnaire tool (IPCAF) was employed. According to the findings, 13% of hospitals had basic IPC practices, 28% had intermediate ones, and 59% had advanced ones. Hospitals using many modes of transportation did well. Therefore, health facilities must offer quality improvement training to IPC nurses and other healthcare workers.

CONCLUSION:

The survey results show that nurses in IC have knowledge levels above the average, although there are still gaps that still need to be remedied. The strongest correlation between hospital accreditation status and expertise is seen. The balance of knowledge between India's 1-tier and 2-tier cities is encouraging and will further aid in closing the gap in healthcare quality across different cities around the nation. To reduce patient mortality and morbidity and improve infection control, it is necessary to focus more knowledge and education programmes on infection control in the areas with poor scores.

The largest difficulty in any hospital is infection prevention and control, and nurses' knowledge and understanding of this topic must be improved if it is to be successful. To increase understanding and compliance with IC practices, a multimodal strategy should be used, including training, feedback, and ongoing education programmes.

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