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A Study of Knowledge and Preventive Practices Regarding Nosocomial Infections among Healthcare Workers in Primary Health Centers in Karim Lamido Local Government Area, Taraba State

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ABSTRACT

Nosocomial infections, also referred to as hospital-acquired infections (HAIs), are a prevalent issue in healthcare facilities globally. In Nigeria, numerous lives are lost annually due to the spread of such infections within hospitals. Healthcare workers are not only expected to possess knowledge about HAIs but also to implement preventive measures effectively. This study aimed to evaluate the level of knowledge and preventive practices concerning nosocomial infections among primary healthcare workers in Karim Lamido Local Government Area, Taraba State. A cross-sectional descriptive survey design was employed for this research, conducted within Karim Lamido Local Government Area. Using a multi-stage sampling procedure, 185 primary healthcare workers were selected from primary health facilities in the area. Data collection was carried out through structured questionnaires, and the gathered data were analyzed using statistical tools like frequency and percentage distributions. The results indicated that respondents had good knowledge of infection prevention, with 111 (60.66%) demonstrating adequate understanding. Additionally, primary healthcare workers exhibited positive practices toward preventing nosocomial infections, with 124 (67.76%) adhering to recommended guidelines. Several challenges influencing their knowledge and preventive practices were identified. Statistical analysis revealed no significant association between age, gender, years of service, professional designation, and knowledge or practice levels regarding nosocomial infections, as indicated by p-values exceeding the significance level of 0.05. Based on these findings, it was concluded that primary healthcare workers have sufficient knowledge and maintain favorable preventive practices. It is therefore recommended that regular supportive supervision be implemented to ensure consistent adherence to preventive measures.

Background to the Study

Nosocomial infections, also known as healthcare-associated infections (HAIs), are acquired during the delivery of healthcare services. These infections typically occur more than 48 to 72 hours after admission and within 10 days to 30 days post-discharge. They pose significant threats to patients and contribute to increased mortality and financial burdens due to prolonged hospitalization and treatment costs. Despite advancements in understanding and controlling these infections, they remain a major global public health concern (Arinze-Onyia et al., 2018). Healthcare professionals and patients are continually exposed to microorganisms capable of causing severe or even fatal infections. Hospitals often serve as common transmission sites due to the presence of infected individuals, leading to the spread of pathogens to other patients, staff, and visitors (WHO, 2022). The concentration of virulent organisms like Staphylococcus aureus, Streptococcus pyogenes, Escherichia coli, Pseudomonas aeruginosa, Hepatitis viruses, and Human Immunodeficiency Virus in hospital settings increases the risk of various diseases ranging from minor skin infections to life-threatening conditions (Sarani et al., 2020).

Primary healthcare workers play a crucial role in preventing and controlling nosocomial infections through preventive, promotional, and curative services. Many infections arise from pathogen transmission between patients due to inadequate safety precautions by healthcare workers, such as poor hand hygiene, lack of personal protective equipment use, unsafe injection practices, and improper sterilization of equipment (Mourud, 2021). Studies indicate that the risk of healthcare-associated infections is significantly higher in developing countries compared to developed ones, with estimates suggesting that 5% to 10% of hospitalized patients in developed nations acquire these infections (Collin, 2018). Despite being at greater risk, healthcare workers are essential in preventing and managing nosocomial infections.

Problem Statement

Nosocomial infections represent a critical challenge affecting healthcare quality and patient outcomes. Research suggests that the likelihood of acquiring such infections is 2 to 20 times higher in developing countries than in developed ones. Globally, over 1.4 million people suffer from complications related to hospital-acquired infections (WHO, 2020). Annually, these infections contribute to approximately 80,000 deaths and incur an estimated cost of nearly $2 billion worldwide (Wesley & Margaret, 2021). In the United States alone, nosocomial infections impact over 2 million patients each year, resulting in around 90,000 deaths annually (Chen et al., 2019). Each infection incurs an average cost of $14,000 to $38,000, adding more than $4.5 billion to national healthcare expenditures (Stone et al., 2018).

The World Health Organization (WHO) identifies several factors contributing to the rising incidence of nosocomial infections: overcrowded hospital conditions, increasing numbers of immunocompromised individuals, emerging microorganisms, and growing antibiotic resistance. Therefore, enhancing the knowledge and preventive practices of primary healthcare workers could significantly reduce the transmission of these infections in primary care settings, necessitating further investigation in Karim Lamido Local Government Area, Taraba State.

Justification/Significance

Healthcare-associated infections have long been recognized as key obstacles to effective healthcare delivery. Developing countries face up to 20 times the risk of contracting nosocomial infections compared to developed nations (WHO, 2022). As such, infection control remains a pressing concern, particularly in resource-limited settings where healthcare systems are already strained. Numerous studies highlight the role of primary healthcare workers, including doctors and nurses, in transmitting nosocomial infections. Limited existing literature explores their knowledge and preventive practices, underscoring the need for further research into their impact on infection control. Assessing compliance with infection control measures is vital for ensuring patient and personnel safety. Regular updates and reinforcement of infection control practices should be prioritized in all healthcare environments. Given that primary healthcare serves as the primary access point for most Nigerians, understanding healthcare workers' knowledge and preventive measures can enhance healthcare quality and treatment outcomes. Findings from this study may inform policy development, improve intervention strategies, and contribute to the existing body of knowledge on infection prevention.

Research Objectives

Main Objective:

To assess the knowledge and preventive practices of nosocomial infections among healthcare workers in primary health centers in Karim Lamido Local Government Area, Taraba State.

Specific Objectives

1. Evaluate the knowledge of primary healthcare workers regarding nosocomial infections.
2. Determine the preventive practices adopted by these workers against nosocomial infections.
3. Identify factors influencing their knowledge and preventive practices.

Methodology

Study Area and Setting

Taraba State comprises 16 local government areas (LGAs), one of which is Karim Lamido LGA. The LGA includes 11 wards, one secondary healthcare facility, and 76 primary health centers. With an estimated population of 195,844, Karim Lamido is predominantly agrarian, with rice and yam cultivation being key agricultural activities. The predominant languages spoken are Wurkun, while Christianity and Islam are the main religions practiced.

Study Design

This study utilized a cross-sectional descriptive survey approach.

Study Population

The target population consisted of primary healthcare workers operating within the local government's health facilities.

Inclusion Criteria

Primary healthcare workers with direct responsibilities in these facilities, regardless of years of service, were included. Participants encompassed community health officers, nurses, medical laboratory scientists/technicians, community health extension workers, health record officers, administrative staff, pharmacists, and cleaners.

Exclusion Criteria

Non-facility-based healthcare workers were excluded from the study.

Sample size Determination

The minimum sample size was determined using the Kish formula n= $\frac{Z^2\ Pq}{e^2}$ where:

n = sample size

z = confidence limit at 95% which is equivalent to 1.96 standard deviate

p = being a proportion of respondents with good knowledge of infection prevention and control from a previous similar study 87.5% 0.875 ***(Aminaho, 2019).***

q = 1-p = 1-0.875 = 0.125

e = margin of error acceptable for the study = 5% = 0.05

Therefore

$n= \frac{1.96^2\ (0.875)(0.125)}{0.05^2}$

$n= \frac{1.96 \times 1.96(0.875)(0.125)}{0.0025}$

$n= \frac{(3.8416)(0.109375)}{0.0025}$

$n= \frac{0.420175}{0.0025}$

n = 168.07 = 168

Allowing for attrition, poorly filled questionnaire, a 10% of the sample size will be added = 168 + 17 = 185

Therefore the sample, n = 185

Sampling Technique

A multistage sampling method incorporating stratified and random sampling techniques was employed.

Data Collection

The researcher and assistants administered the survey instruments directly.

Data Analysis

Statistical Package for Social Sciences (SPSS) version 20 was used for data analysis. Descriptive statistics, including frequencies and percentages, were presented in tables. Chi-square tests assessed associations between categorical variables, with significance determined at a p-value of 0.05.

Ethical Considerations

This study involved collecting information on participants' knowledge and prevention practices without invasive procedures. Ethical clearance was obtained from Bingham University Teaching Hospital Ethics Committee (BHUTHREC). Permission to conduct the study was granted by the Karim Lamido Local Government Council

Results

Knowledge of PHC workers about nosocomial infection

Table 1: Knowledge of PHC Workers about Nosocomial Infection

Items	Correct	Incorrect
	No.	**No.**
Nosocomial infection is an infection gotten from the hospital during admission of the patient	150 (82.0)	33 (18.0)
Nosocomial infection is also known as hospital acquired	154 (84.2)	29 (15.9)
Organism that causes nosocomial infection include *streptococcus spp,* staphylococci and Acinetobacter	168 (91.8)	15 (8.2)
Prolong hospital stay increases the risk of nosocomial infection	160 (87.4)	23 (12.5)
Health care workers and patients can get infection from the hospital or health facility	170 (92.9)	13 (7.1)
Regular training of health care workers on infection prevention technique can help to reduce the spread of nosocomial infections	174 (95.1)	9 (4.9)
Nosocomial infection can be transmitted through water	151 (82.5)	32 (17.4)
Micro-organism are destroyed by using only clean water	73 (39.9)	110 (60.1)
Nosocomial infection can be transmitted by medical equipment such as syringes, needles, catheters, stethoscope, thermometer etc.	163 (89.1)	20 (10.9)
Considering all unsterile needle and sharp as contaminated can reduce the spread of nosocomial infection	106 (57.9)	77 (42.1)

Table 1 above the responses of the respondents about their knowledge regards Nosocomial infections. The table revealed that respondents are knowledgeable about nosocomial as they agreed that Nosocomial infection is an infection gotten from the hospital during admission of the patient with 150 (82.0%), they also agreed that Organism that causes nosocomial infection include *streptococcus spp, staphylococci* and Acinetobacter with 168 (91.8%). They also agreed that Prolong hospital stay increases the risk of nosocomial infection, Health care workers and patients can get infection from the hospital or health facility, Regular training of health care workers on infection prevention technique can help to reduce the spread of nosocomial infections with 160 (87.4%), 170 (92.9%) and 174 (95.1%) respectively. Respondents disagreed with this statement that Micro-organism are destroyed by using only clean water with 110 (60.1) among others.

Preventive practices against nosocomial infection among PHC workers

Table 2: Preventive practices against nosocomial infection among PHC workers

Items	Appropriate	Inappropriate
	No.	**No.**
I wash my hands immediately after removing gloves from your hand	179 (97.8)	4 (2.1)
I used hand sanitizers after procedure	172 (94.0)	11 (6.0)
I remove rings and bracelets before commencing hand hygiene	167 (91.3)	16 (8.8)
I wash my hand immediately I come in contact with blood and body fluid or other contaminated objects	178 (97.3)	5 (2.7)
I go for vaccination against some common infections like hepatitis B, influenza virus, tuberculosis etc.	170 (92.9)	13 (7.1)
I recap needle after use and before disposal	84 (45.9)	99 (54.1)
I wear personal protective equipment when handling linen	171 (93.4)	12 (6.5)
I put on a mask and glasses when performing invasive and body fluid procedure	168 (91.8)	15 (8.2)
I follow the World Health Organization's 5 moments of hand hygiene	168 (91.8)	15 (8.2)

Table 2 also revealed the responses of the respondents on preventive practice against nosocomial. The table shows that respondents has good practice against the prevention of nosocomial infection. Respondents agreed that they washed their hands with soap and water before and after attending to patient, they used hand sanitizers after each procedure, they washed their hands immediately they come in contact with blood and body fluid or other contaminated objects, they follow the World Health Organization's 5 moments of hand hygiene with 179 (97.3%), 172 (94.0%), 178 (97.3%) and 168 (91.8%) respectively. Respondents also disagree with this statement that I recap needle after use and before disposal with 99 (54.1) among others.

Determinants of Knowledge and Preventive Practices of Nosocomial Infections among PHC Workers

Table 3: Determinants of knowledge and preventive practices of nosocomial infections among PHC workers

Items	Agreed	Disagreed	I don't know
	No.	**No.**	**No.**
The workload affects my ability to apply infection prevention guidelines.	110 (60.1)	69 (37.7)	4 (2.2)
Lack of supervision from the infection control department makes it difficult to follow the procedure guidelines of infection prevention and control in the hospital	132 (72.1)	51 (27.9)	0 (0.00)
Lack of in-service training or workshop by the hospital make me ignore the standard precautions in the hospital	145 (79.2)	37 (20.2)	1 (0.5)
Hospital equipment are not readily available to practice infection prevention and control	145 (79.2)	37 (20.2)	1 (0.5)
The distance from the necessary facilities influences infection prevention practice in the hospital	136 (74.3)	41 (22.4)	6 (3.3)
Adequate knowledge of nosocomial infection and chain of infection promotes my infection preventive practices.	153 (83.6)	29 (15.8)	1 (0.5)
Inadequate knowledge of nosocomial infection prevention guidelines affects the preventive practice	155 (84.7)	26 (14.2)	2 (1.1)
The part-time health workers in the hospital serves as a barrier to infection prevention	91 (49.7)	85 (46.4)	7 (3.8)
The perception that nosocomial infection cannot be completely eradicated affects the preventive practice of Nosocomial infection	119 (65.0)	56 (30.6)	8 (4.4)
The part-time health workers in the hospital serves as a barrier to infection prevention	99 (54.1)	75 (41.0)	9 (4.9)

Table 3 revealed the responses of the respondents on factors that determine the knowledge and the preventive practices of nosocomial infection PHC workers. The table indicates several factors that determine the respondent's knowledge and the preventive practice of nosocomial infection which includes workload affects my ability to apply infection prevention guidelines, lack of supervision from the infection control department makes it difficult to follow the procedure guidelines of infection prevention and control in the hospital, lack of in-service training or workshop by the hospital make me ignore the standard precautions in the hospital with 110 (60.1%), 132 (72.1%) and 145 (79.2%) respectively. Other factors according to the respondents responses are hospital equipment are not readily available to practice infection prevention and control, the distance from the necessary facilities influences infection prevention practice in the hospital, inadequate knowledge of nosocomial infection prevention guidelines affects the preventive practice with 145 (79.2%), 136 (74.3%) and 155 (84.7%) respectively. They also agreed that the perception that nosocomial infection cannot be completely eradicated affects the preventive practice of Nosocomial infection with 119 (65.0%) among others.

Table 4: Knowledge of primary health care workers and prevention of nosocomial infection

Professional Designation	Excellent Knowledge (75 – 100)	Good Knowledge (50 – 74)	Poor Knowledge (1 – 49)	Total
CHO	2 (100.0)	0 (0.00)	0 (0.00)	2 (100.00)
CHEW	35 (62.50)	10 (17.86)	11 (19.61)	56 (100.00)
JCHEW	10 (52.63)	8 (42.11)	1 (5.26)	19 (100.00)
Nurse/midwife	5 (83.33)	1 (16.67)	0 (0.00)	6 (100.00)
Laboratory Personnel	17 (65.38)	5 (19.23)	4 (15.38)	26 (100.00)
Cleaner	12 (52.17)	4 (17.39)	7 (30.43)	23 (100.00)
Doctor	1 (100.00)	0 (0.00)	0 (0.00)	1 (100.00)
Administrative Staff	2 (66.67)	0 (0.00)	1 (33.33)	3 (100.00)
Health Record Officer	8 (80.00)	1 (10.00)	1 (10.00)	10 (100.00)
Pharmacy Staff	1 (100.00)	0 (0.00)	0 (0.00)	1 (100.00)
Others	18 (52.94)	9 (26.47)	9 (26.47)	36 (100.00)
Total	**111 (60.66)**	**38 (20.77)**	**34 (18.58)**	**183 (100.00)**

X^2 = 17.496; pV = 0.6206

Table 4 above show knowledge on the preventive practice among different cadres of health care workers. The result indicate that, majority of health care workers has good knowledge on nosocomial infection. It shows a total 111 represent 60.66% has excellent knowledge, 38 represent 20.77% has good knowledge while 34 represent 18.58% has poor knowledge. The calculated Chi-Square value of 17.496 and the P-Value of 0.6206 indicate that, there is no statistical relationship or association between knowledge and the preventive practice of nosocomial and the cadres of health workers working in PHC facilities.

Table 5: Test of Association between demographic and knowledge of the respondents

Demographic Variables	Responses	Frequency	Chi- Square	DF	Pv
Age (Years)	18 - 28	67 (36.6)	31.177[a]	30	.407
	29 - 38	55 (30.1)			
	39 - 48	44 (24.0)			
	49 and Above	17 (9.3)			
	Total	**183 (100.00)**			
Gender	Male	115 (62.8)	21.392[a]	10	.019
	Female	68 (37.2)			
	Total	**183 (100.00)**			
Years in Service	1 - 9	100 (54.6)	30.190[a]	40	.870
	10 - 19	50 (27.3)			
	20 - 29	24 (13.1)			
	30 and Above	9 (4.9)			
	Total	**183 (100.00)**			
Professional Designation	CHO	2 (1.1)	97.299[a]	100	.558
	CHEW	56 (30.6)			
	JCHEW	19 (10.4)			
	Nurse/Midwife	6 (3.3)			
	Laboratory Personnel	26 (14.2)			
	Cleaner	23 (12.6)			
	Doctor	1 (0.5)			
	Administrative Staff	3 (1.6)			
	Health Record Officer	10 (5.5)			
	Pharmacy Personnel	1 (0.5)			
	Others	36 (19.7)			
	Total	**183 (100.00)**			

Table 4.8 revealed the association between demographic variable and the knowledge on the preventive practice of nosocomial infection. It shows that there is no statistical association between Age, years of service and professional designation of the respondents and the knowledge and the preventive practice of the respondents. Because all P value are greater than the significant level of 0.05. it revealed a statistical association between Gender and the knowledge on the preventive practice of nosocomial infections with P value of 0.019. That is to say respondent's knowledge about the preventive practice of nosocomial infection are similar.

Table 6: Test of Association between demographic and the preventive practice of the respondents

Demographic Variables	Responses	Frequency	Chi- Square	DF	Pv
Age (Years)	18 - 28	67 (36.6)	34.159[a]	27	.161
	29 - 38	55 (30.1)			
	39 - 48	44 (24.0)			
	49 and Above	17 (9.3)			
	Total	**183 (100.00)**			
Gender	Male	115 (62.8)	16.163[a]	9	.064
	Female	68 (37.2)			
	Total	**183 (100.00)**			
Years in Service	1 - 9	100 (54.6)	32.955[a]	36	.614
	10 - 19	50 (27.3)			
	20 - 29	24 (13.1)			
	30 and Above	9 (4.9)			
	Total	**183 (100.00)**			
Designation Professional	CHO	2 (1.1)	99.950[a]	90	.222
	CHEW	56 (30.6)			
	JCHEW	19 (10.4)			
	Nurse/Midwife	6 (3.3)			
	Laboratory Personnel	26 (14.2)			
	Cleaner	23 (12.6)			
	Doctor	1 (0.5)			
	Administrative Staff	3 (1.6)			
	Health Record Officer	10 (5.5)			
	Pharmacy Personnel	1 (0.5)			
	Others	36 (19.7)			
	Total	**183 (100.00)**			

Table 4.9 revealed the association between demographic variable and the preventive practice of nosocomial infection. It shows that there is no statistical association between Age, Gender, years of service and professional designation and the preventive practice of the respondents. Because all P values are greater than the significant level of 0.05. That is to say respondent's level of preventive practice of nosocomial infection similar.

Discussion

Knowledge of Healthcare Workers Regarding Nosocomial Infections

The findings from this study indicate that healthcare workers in primary health centers within Karim Lamido Local Government Area possess a solid understanding of nosocomial infections. Specifically, 111 respondents (60.66%) demonstrated good knowledge. A significant majority recognized that nosocomial infections are acquired during hospital stays, with 150 participants (82.0%) agreeing on this point. Furthermore, 168 respondents (91.8%) correctly identified common causative agents such as Streptococcus spp., Staphylococcus, and Acinetobacter. Additionally, most participants

acknowledged that prolonged hospitalization increases infection risk (87.4%), that both patients and staff can contract infections (92.9%), and that regular training enhances prevention efforts (95.1%). However, a notable portion (60.1%) incorrectly believed that clean water alone is sufficient to eliminate microorganisms.

This indicates a generally high level of awareness among healthcare workers regarding nosocomial infections. The chi-square test result ($X^2 = 17.496$; $p = 0.6206$) suggests no statistically significant relationship between professional designation and knowledge levels, indicating consistent understanding across different cadres of workers.

These results align with those of Maitanmi and Anise (2021), who also found high knowledge levels among healthcare workers concerning nosocomial infections. Similarly, Arinze-Onyia et al. (2018) reported that over two-thirds of surveyed healthcare professionals exhibited strong knowledge of standard precautions in Enugu, Nigeria. This consistency across studies reinforces the idea that formal education and workplace exposure contribute significantly to awareness about hospital-acquired infections.

Preventive Practices against Nosocomial Infections

The study also revealed that a majority of healthcare workers—124 respondents (67.76%)—demonstrated appropriate preventive practices. High compliance was observed in hand hygiene routines, with 179 participants (97.3%) washing hands after glove removal, and 178 (97.3%) doing so after contact with bodily fluids. Nearly all respondents (94%) used hand sanitizers after procedures, and 168 (91.8%) adhered to WHO's five moments of hand hygiene. However, a concerning number—99 respondents (54.1%)—still engaged in unsafe needle recapping before disposal. The chi-square test ($X^2 = 5.894$; $p = 0.1169$) indicated no significant association between years of service and preventive practices, suggesting that experience did not strongly influence adherence to safety protocols.

These findings correspond with those of Aminaho (2019), who noted high awareness and good preventive practices among health workers in Rivers State, Nigeria. Similarly, Arinze-Onyia et al. (2018) observed high preventive practice scores among healthcare workers in Ogun State. Alrubaiee et al. (2017) also reported fair to good practices among nurses, although their study showed lower percentages compared to this research. These comparisons suggest that while overall preventive behavior is improving, certain unsafe practices still persist and require targeted interventions.

Determinants of Knowledge and Preventive Practices

Several factors were identified as influencing the knowledge and preventive behaviors of healthcare workers. Over 70% of respondents cited inadequate supervision from infection control departments as a barrier to following guidelines. A similar proportion (79.2%) attributed poor adherence to a lack of in-service training or workshops. Limited availability of necessary equipment (79.2%) and physical distance from essential facilities (74.3%) were also frequently mentioned as challenges. Additionally, many respondents (84.7%) acknowledged that insufficient knowledge of prevention guidelines negatively impacted their practices.

These findings echo those of Alrubaiee et al. (2017), who identified workload, lack of supervision, and limited training as key barriers to effective infection control. Aminaho (2019) similarly noted that shortages of equipment like handwashing sinks hindered proper hygiene practices. These recurring themes across multiple studies emphasize the need for institutional support, adequate resources, and ongoing educational programs to sustain improvements in infection prevention.

Conclusion

The study clearly demonstrates that the majority of healthcare workers in Karim Lamido LGA have adequate knowledge and generally positive attitudes toward the prevention and control of nosocomial infections. Their understanding of transmission routes and preventive measures appears to be sound. However, there remain gaps in actual practice, particularly concerning safe injection techniques and resource limitations.

It is evident that adherence to standard precautions plays a critical role in reducing the spread of infections in healthcare settings. Proper hand hygiene remains one of the most effective strategies for preventing cross-contamination. Despite the existing knowledge, lapses in practice highlight the importance of translating theoretical understanding into consistent clinical behavior.

Healthcare workers serve as crucial intermediaries between theory and application in infection control. Therefore, fostering a culture of continuous learning and improvement is essential to ensure that patients receive safe and quality care. If healthcare providers maintain strong knowledge and positive attitudes toward infection control, it is reasonable to expect improved compliance with preventive measures and better patient outcomes.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Increase Institutional Support and Funding: The government, through the Ministry of Health, should allocate additional funds and necessary resources to primary healthcare facilities to strengthen infection prevention and control systems. This includes ensuring access to personal protective equipment (PPE), hand hygiene supplies, and sterilization tools.

2. Curriculum Enhancement in Training Institutions: Medical and nursing schools should incorporate comprehensive modules on infection control, especially focusing on nosocomial infections. Curriculum updates should aim to instill early awareness and best practices among future healthcare professionals before they enter clinical environments.

3. Establishment of Infection Prevention Committees: All levels of healthcare institutions—primary, secondary, and tertiary—should form dedicated infection control teams responsible for monitoring, evaluating, and enhancing staff preparedness. These committees should organize regular training sessions, in-service education, and refresher courses tailored to specific job roles.

4. Capacity Building for Primary Healthcare Workers: PHC workers should receive continuous professional development focused on equipping them with updated knowledge, practical skills, and positive attitudes toward infection control. Every healthcare worker must understand and commit to following established infection prevention guidelines.

5. Integration of Standard Precautions into Daily Practice: Standard precautions should be embedded into routine operations through clear policies, protocols, and performance evaluations. Encouraging team-based approaches and reinforcing safety norms at all levels will help promote a culture of safety and accountability in infection control.

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