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Assessment of Knowledge and Attitudes of Healthcare Workers on Infection Prevention and Control (IPC) Measures at Kenema Government Hospital

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ABSTRACT

Infection Prevention and Control (IPC) practices are vital for ensuring patient safety and mitigating healthcare-associated infections (HAIs), particularly in resource-limited settings like Sierra Leone. This study assesses the knowledge, attitudes, and influencing factors related to IPC among healthcare workers (HCWs) at Kenema Government Hospital (KGH), a critical referral and infectious disease treatment center in eastern Sierra Leone. Employing a quantitative descriptive cross-sectional design, data were collected from 230 HCWs across various departments using a structured questionnaire. Results indicate generally high levels of IPC knowledge and positive attitudes toward compliance, with over 80% familiarity with key IPC measures such as hand hygiene, personal protective equipment use, and sharps disposal. Nonetheless, gaps remain, including inconsistent training coverage, resource limitations, workload pressures, and perceived insufficiencies in institutional support. Attitudinal barriers such as discomfort with PPE and occasional lapses under pressure were also identified. The study underscores the need for sustained government investment, strengthened hospital management policies, and targeted refresher training for community health workers to bridge knowledge-practice gaps. Findings inform strategies for enhancing IPC adherence at KGH and similar settings, contributing to improved infection control, epidemic preparedness, and health system resilience in Sierra Leone.

Key Words: Infection Prevention and Control (IPC)**,** Healthcare Workers (HCWs)**,** Healthcare-Associated Infections (HAIs)**,** Personal Protective Equipment (PPE)**,** Community Health Workers (CHWs)

Background of the Study

Infection Prevention and Control (IPC) strategies are globally recognized as essential for effective healthcare delivery, patient safety, and public health. Healthcare-associated infections (HAIs) remain alarmingly high, particularly in low- and middle-income countries (LMICs), where resource constraints increase vulnerability (WHO, 2020). Healthcare workers (HCWs), as frontline providers, play a central role in implementing IPC practices such as hand hygiene, personal protective equipment (PPE) use, waste segregation, environmental sanitation, and safe injection protocols. Adherence to these measures significantly reduces HAIs, improves outcomes, and protects both patients and providers. Yet, major implementation gaps persist in resource-limited settings, including Sierra Leone (Pereira et al., 2021).

Sierra Leone's health system faces recurring outbreaks of infectious diseases such as Lassa fever, Ebola virus disease (EVD), and COVID-19, underscoring the urgency of robust IPC mechanisms. These outbreaks have exposed weaknesses in infection control, particularly at Kenema Government Hospital (KGH), a leading referral and infectious disease treatment center in the Eastern Province. While KGH plays a strategic role in diagnosis, management, and containment, it

reflects common systemic challenges poor infrastructure, supply chain disruptions, workforce shortages, and limited training (MoHS, 2021).

The 2014–2016 Ebola outbreak illustrated the deadly consequences of IPC failure. Over 300 HCWs died, largely due to insufficient protection, inadequate knowledge, and lack of standardized training (Kilmarx et al., 2014). Despite post-Ebola investments in IPC capacity building, the extent of change in everyday practice remains uncertain. As a frontline institution for Ebola and Lassa fever, KGH must prioritize IPC compliance (Kamara et al., 2019).

Although national IPC guidelines exist, adherence among frontline staff is inconsistent. Barriers include inadequate training, unreliable PPE availability, poor facility infrastructure, and low morale. Studies confirm that policies alone do not ensure compliance; knowledge, attitudes, and perceptions of HCWs are critical (Kakyo et al., 2012; WHO, 2021). If workers view IPC measures as unnecessary, impractical, or burdensome, adherence declines, heightening infection risks.

Sociocultural and behavioral factors also affect IPC practices. Workplace culture, peer influence, organizational support, and leadership can either reinforce or undermine compliance. Apathy, fatalism, and skepticism toward protocols are common barriers (Jalloh et al., 2020). Some HCWs see IPC as a management responsibility rather than a shared clinical duty, weakening implementation.

KGH has reported periodic nosocomial outbreaks linked to breaches in IPC protocols. Common issues include improper handwashing, unsafe waste disposal, and insufficient PPE use, particularly during night shifts or overcrowding (CDC, 2021; Seid & Metaferia, 2018). Infrastructure challenges broken handwashing stations, poor ventilation, unreliable water supply, and lack of isolation units worsen these problems.

Evidence shows that targeted, well-designed IPC training can improve staff compliance (Pereira et al., 2021). However, many programs in Sierra Leone are donor-driven, one-off interventions with little follow-up or monitoring. Knowledge transfer is also hampered by workplace hierarchies, where junior staff may not feel empowered to act despite being informed.

Given these challenges, assessing HCWs' knowledge, attitudes, and practices (KAP) regarding IPC at KGH is both timely and necessary. Such an appraisal can reveal gaps and constraints that impede infection control, providing actionable insights for administrators, policymakers, and partners. This study will use a mixed-methods approach to assess knowledge levels across doctors, nurses, laboratory staff, cleaners, and administrative workers, while exploring perceptions, motivations, and institutional influences such as supervision, supply chains, and feedback systems.

Improving IPC at facilities like KGH is not merely about professional hygiene but is a public health imperative with implications for epidemic preparedness, maternal and child health, antimicrobial resistance, and system resilience. Strong IPC reduces hospital stays, costs, and drug-resistant infections, while increasing public trust. Addressing IPC challenges at KGH can serve as a model for broader reforms in Sierra Leone. This study therefore aims to fill a critical gap by providing a comprehensive assessment of IPC compliance in one of the country's most vital hospitals, contributing to both national and global health system strengthening.

Statement of the Problem

HCWs at KGH work in resource-constrained conditions marked by shortages of IPC supplies, inadequate training, and high patient-to-staff ratios (Jalloh et al., 2020). These factors raise the risk of HAIs, prolong hospital stays, increase costs, and heighten morbidity and mortality (WHO, 2018). Despite IPC's importance, adherence in Sierra Leone remains low.

Research shows that gaps in knowledge and negative attitudes contribute to higher infection rates (Seid & Metaferia, 2018). Standard precautions hand hygiene, PPE use, environmental cleaning, and waste segregation may not be fully understood by HCWs (Kakyo et al., 2012). Even when knowledge exists, implementation is hindered by workload demands, poor support, and perceptions of IPC as time-consuming (WHO, 2021).

The Ebola outbreak highlighted the devastating effects of poor IPC, with many HCWs infected due to inadequate protection (Kilmarx et al., 2014). Lessons learned stress the need for ongoing training, behavior change, and resource availability. Yet, post-Ebola studies reveal persistent gaps: weak infrastructure, inconsistent compliance, and PPE shortages (Kamara et al., 2019).

Some HCWs view IPC as necessary only during epidemics, while traditional beliefs sometimes conflict with biomedical practices (Jalloh et al., 2020). Low motivation, poor supervision, and understaffing further worsen non-compliance. Many staff see IPC as an added burden rather than integral to care.

Although other studies have identified gaps in HCWs' knowledge and attitudes in similar contexts, little research has focused specifically on KGH. Understanding these factors is vital for designing interventions to strengthen IPC and reduce HAIs. This study therefore evaluates HCWs' knowledge, attitudes, and influencing factors regarding IPC at KGH.

Aim

The general aim of this research is to assess the knowledge and attitudes of healthcare workers on infection prevention and control (IPC) measures at Kenema Government Hospital.

Objectives

1. Evaluate HCWs' knowledge of IPC measures.
2. Examine HCWs' attitudes toward IPC practices.
3. Identify factors influencing HCWs' knowledge and attitudes toward IPC.

Research Questions

1. What is the level of HCWs' knowledge of IPC at KGH?
2. What are HCWs' attitudes toward implementing IPC practices?
3. What factors influence HCWs' knowledge and attitudes toward IPC?

Research Hypothesis

- **Null (H_0):** There is no significant relationship between HCWs' knowledge and attitudes toward IPC at KGH.
- **Alternative (H_1):** There is a significant relationship between HCWs' knowledge and attitudes toward IPC at KGH.

Significance of the Study

This study explores HCWs' knowledge and attitudes toward IPC as a foundation for safer patient care. HAIs increase illness, hospital stays, and costs. By identifying weaknesses in IPC practices at KGH, the study provides evidence to strengthen training, improve resources, and enhance guidelines.

Healthcare workers face high risks of exposure in resource-limited settings. Understanding their knowledge and attitudes is vital for protecting them and preventing transmission within hospitals and communities. Strengthened IPC reduces infections, costs, and drug resistance, while improving care quality and patient trust.

Findings will support administrators, policymakers, and public health officials in designing targeted programs. By identifying gaps in knowledge, the study informs focused training that fosters a sustainable IPC culture. Effective IPC will reduce antibiotic use, prevent resistance, and lessen financial strain on facilities and patients.

At a broader level, the study contributes to Sierra Leone's preparedness for outbreaks and strengthens health system resilience. It also adds to global evidence on IPC in LMICs, serving as a reference for future interventions and policy.

Scope and Delimitation

The study focuses on HCWs at KGH, including doctors, nurses, and laboratory staff directly involved in patient care. It will assess knowledge, attitudes, and factors influencing IPC practices such as hand hygiene, PPE use, waste management, and environmental cleaning. Data will be collected through interviews and direct observations.

The study excludes non-clinical staff such as administrators, cleaners, and security personnel. It emphasizes HCWs' knowledge and attitudes rather than direct measurement of compliance or patient perspectives. Limitations of time and resources may restrict participant numbers and generalizability.

Literature Review

Concept of Infection Prevention and Control (IPC)

Infection Prevention and Control (IPC) refers to systematic practices designed to prevent and contain infections in healthcare settings. It combines strategies such as hand hygiene, environmental cleaning, use of personal protective equipment (PPE), isolation procedures, and safe waste management. These measures aim to protect patients, health workers, and visitors from healthcare-associated infections (HAIs). Effective IPC minimizes the spread of infectious diseases, reduces antimicrobial resistance, and safeguards health system resilience, especially during outbreaks (World Health Organization [WHO], 2021).

The relevance of IPC has been heightened by epidemics such as Ebola Virus Disease (EVD), COVID-19, and Lassa fever, which exposed weaknesses in health systems across West Africa. The 2014–2016 Ebola epidemic in Sierra Leone demonstrated the life-saving role of IPC, as lapses in hand hygiene, poor PPE use, and weak waste disposal practices fueled infection transmission within hospitals. Similarly, COVID-19 emphasized the necessity of IPC not only in health facilities but also at the community level (Conteh, 2022).

Within Sierra Leone, IPC is both a technical and behavioral practice. It involves adherence to evidence-based protocols but also requires consistent compliance by healthcare workers, patients, and visitors. A hospital such as Kenema Government Hospital (KGH) a referral facility and historical epicenter of Ebola highlights how IPC is central to controlling Lassa fever and other endemic diseases. For nurses, who have the most patient contact, IPC knowledge and consistent practice remain crucial for breaking infection chains and sustaining trust in the health system.

Concept of Knowledge

Knowledge in health refers to awareness and understanding of facts, principles, and skills relevant to disease prevention and care. It goes beyond memorization, encompassing comprehension, application, and decision-making. Within IPC, knowledge relates to knowing disease transmission routes, the correct use of PPE, hand hygiene procedures, and environmental sanitation (Ajzen, 1991).

High levels of knowledge among healthcare workers are strongly linked to safe practices and lower risks of HAIs. However, knowledge gaps persist in many low- and middle-income countries (LMICs). For example, a study in Nigeria revealed that while most nurses understood hand hygiene principles, compliance was inconsistent due to workload and limited resources (Okeke et al., 2020). In Sierra Leone, studies after Ebola showed improved awareness of IPC but also highlighted variations in actual application across hospitals (Bangura, 2021).

Knowledge also influences confidence. According to Bandura's Social Cognitive Theory, mastery of knowledge enhances self-efficacy, making healthcare workers more willing to adopt preventive measures consistently. Conversely, limited knowledge contributes to uncertainty, errors, and increased occupational risk.

Concept of Attitude

Attitude encompasses individuals' beliefs, values, and emotional dispositions that shape their behavior toward a subject. In IPC, attitudes reflect the willingness of healthcare workers to embrace prevention practices despite challenges. Positive attitudes foster adherence, while negative attitudes such as seeing hand hygiene as time-consuming—undermine compliance (Ajzen, 1991).

Attitudes are influenced by both personal and systemic factors. Nurses working in supportive environments with adequate PPE and training are more likely to maintain positive IPC attitudes. In contrast, scarcity of supplies, weak supervision, and cultural perceptions may erode motivation. For example, in Ethiopia, Demissie et al. (2019) found that although nurses valued IPC, many believed compliance was unrealistic under heavy workloads. In Sierra Leone, lingering fears from Ebola shaped attitudes toward PPE use, with some workers perceiving it as uncomfortable or stigmatizing (Conteh, 2020).

Concept of the Health Belief Model (HBM)

The Health Belief Model (HBM) provides a framework for understanding why individuals adopt or resist health behaviors. It emphasizes perceptions of susceptibility, severity, benefits, barriers, cues to action, and self-efficacy (Rosenstock, 1974). Applied to IPC, the HBM explains how nurses' perception of risk influences their compliance.

Perceived Susceptibility: Nurses who believe they are at risk of acquiring HAIs or contracting diseases like Lassa fever are more motivated to adhere to IPC.

- **Perceived Severity**: Awareness of the life-threatening nature of infections heightens motivation. The devastating experience of Ebola serves as a strong reminder of the consequences of neglecting IPC.
- **Perceived Benefits**: When nurses recognize that IPC protects both themselves and patients, compliance improves.
- **Perceived Barriers**: Lack of PPE, overcrowding, or inadequate water supply discourage practice.
- **Cues to Action**: Training sessions, reminders, and supervision act as triggers for compliance.
- **Self-Efficacy**: Confidence in one's ability to implement IPC procedures determines consistency.

Empirical Review

Studies in Developed Countries

Research in high-income settings demonstrates how strong systems and resources facilitate IPC. In the United Kingdom, Gould et al. (2017) showed that structured hand hygiene programs reduced hospital-acquired infections significantly. In Canada, Miller et al. (2019) linked nurse training and availability of PPE with consistent compliance. Similarly, Korea's investment in training after the MERS outbreak improved long-term IPC culture in hospitals (Park, 2018).

These findings highlight that in developed contexts, structural enablers adequate supplies, institutional policies, and ongoing education support adherence. However, such conditions are often absent in LMICs, including Sierra Leone.

Studies in Developing Countries

Evidence from developing contexts underscores systemic challenges. In Nigeria, Eze et al. (2020) reported that while nurses had good IPC knowledge, compliance was undermined by overcrowding and irregular water supply. In Ethiopia, Demissie et al. (2019) found knowledge did not always translate into practice due to high patient load. Ghanaian studies similarly identified shortages of gloves and disinfectants as barriers (Boateng, 2020).

In Sierra Leone, Conteh (2022) noted that IPC improved after Ebola, but gaps remain in sustainability. Training fatigue, resource shortages, and inconsistent supervision reduce long-term compliance. At KGH, adherence to IPC is particularly critical because of its dual role as a referral hospital and as a treatment center for Lassa fever.

Studies Specific to Sierra Leone

The Ebola crisis transformed IPC in Sierra Leone. During the outbreak, hospitals became epicenters of transmission, with health workers facing disproportionate mortality. Post-Ebola, significant donor investment improved infrastructure, training, and guidelines (WHO, 2017). Yet, sustainability remains a challenge.

A study by Bangura (2021) revealed that while most nurses recognized the importance of IPC, fewer than half practiced hand hygiene at recommended moments. Similarly, Conteh (2020) found that PPE was often underutilized due to discomfort, unavailability, or perceptions of stigma. These findings suggest a gap between knowledge and consistent practice.

KGH offers an important case. Its long history with Lassa fever has made IPC central to operations, but ongoing challenges include inadequate isolation facilities, shortages of disinfectants, and heavy patient loads. Nurses' attitudes shaped by risk perception, training, and prior experiences—remain critical in determining compliance.

Theoretical Framework

This study adopts the **Health Belief Model (HBM)** as its guiding framework. The HBM is suitable for explaining nurses' knowledge, attitudes, and behaviors toward IPC because it connects risk perception with health actions. Nurses who perceive themselves as highly susceptible to infections and who view these infections as severe are more motivated to comply with IPC guidelines. Conversely, barriers such as lack of PPE can limit their practice even when knowledge is adequate.

The model also highlights the role of self-efficacy and cues to action. In KGH, ongoing training, posters, and supervisory reminders act as triggers for behavior, while past experiences with Ebola and Lassa fever amplify perceived severity and susceptibility. Thus, the HBM provides a comprehensive lens through which to analyze how nurses' knowledge and attitudes translate or fail to translate into effective IPC practice.

Methodology

Research Design

This study employed a quantitative descriptive cross-sectional design, allowing data to be collected at a single point in time to provide a "snapshot" of healthcare workers' (HCWs) knowledge and attitudes toward infection prevention and control (IPC). Cross-sectional surveys are effective for estimating the prevalence of specific characteristics within a population and are widely applied in public health research to establish baseline information for interventions.

A structured and pre-tested questionnaire with closed-ended questions was used to generate standardized and quantifiable data for statistical analysis. This design enabled comparisons across different categories of HCWs while minimizing cost and time. It was particularly suitable for the resource-limited setting of Kenema Government Hospital (KGH), as it avoided experimental manipulation and ethical complications while producing data that could inform targeted educational and institutional IPC interventions.

Study Area

The study was conducted at Kenema Government Hospital (KGH) in Kenema District, Eastern Province, Sierra Leone. KGH serves a catchment population of over 600,000 people, providing medical services in internal medicine, surgery, pediatrics, obstetrics and gynecology, and infectious diseases. As a government facility under the Ministry of Health and Sanitation, KGH plays a critical role in the country's healthcare system.

During the 2014–2016 Ebola outbreak, KGH functioned as a treatment and training hub for IPC and later benefited from substantial investment in staff training, PPE, and infrastructure. It continues to serve as a focal point for IPC-related activities due to its exposure to Ebola, Lassa fever, and COVID-19. These experiences made KGH an appropriate and strategic setting for assessing HCWs' IPC knowledge and attitudes.

Population of the Study

The study population comprised all HCWs employed at KGH who were directly involved in patient care or hospital hygiene. This included doctors, nurses, laboratory technicians, and allied health professionals, as well as ancillary staff such as cleaners and porters. These groups were targeted because of their integral roles in IPC implementation across patient diagnosis, treatment, and sanitation.

Inclusion criteria: HCWs employed at KGH during data collection, including clinical staff and support workers, who consented to participate.

Exclusion criteria: HCWs on leave or secondment, those not directly engaged in patient care (such as administrators), and those who declined to provide consent.

Sampling Procedure

A stratified random sampling technique was applied. HCWs were grouped into strata—doctors, nurses, laboratory staff, and ancillary workers—to ensure proportional representation across professional categories. Within each stratum, participants were randomly selected. This minimized selection bias, captured diverse perspectives, and enhanced the generalizability of the findings.

Instrument for Data Collection

Data were collected using a structured self-administered questionnaire adapted from validated IPC studies and refined for the local context. The tool was divided into four sections:

1. **Demographics**: age, gender, job category, years of experience, and educational background.
2. **Knowledge**: questions on hand hygiene, PPE, waste management, and infectious disease protocols (yes/no and multiple-choice).
3. **Attitudes**: Likert-scale items assessing perceptions, motivation, and beliefs about IPC practices.
4. **Influencing factors**: questions on organizational support, resource availability, training opportunities, and barriers to IPC adherence.

Closed-ended and Likert-scale questions generated quantitative data suitable for statistical analysis of knowledge gaps, attitudinal patterns, and influencing factors.

Validation and Reliability

Validity

Content validity was ensured by adapting questions from existing validated IPC instruments, followed by review and approval from the research supervisor. A pilot test was conducted among a small group of HCWs at KGH who were not included in the final study. Their feedback was used to refine the wording, clarity, and relevance of items to align with respondents' professional and educational backgrounds.

Reliability

The pilot test also helped establish reliability. Ambiguities were revised, and data collection procedures were standardized. Close supervision during questionnaire administration further reduced response errors and improved consistency.

Method of Data Collection

Following ethical approval and administrative clearance, data collection was conducted over two weeks. Trained research assistants distributed and retrieved the questionnaires from the selected participants. Informed consent was obtained from all respondents prior to participation, and anonymity was guaranteed.

The questionnaire required approximately 10 minutes to complete. All returned questionnaires were reviewed for completeness, ensuring high response quality.

Method of Data Analysis

Completed questionnaires were cleaned, coded, and analyzed using Microsoft Excel and Word. Descriptive statistics, including frequencies, percentages, means, and standard deviations, summarized demographic characteristics, knowledge, and attitudes. Findings were presented in tables, bar charts, and pie charts to facilitate clear interpretation.

Where relevant, inferential analysis was performed to explore associations between demographic characteristics and IPC knowledge or attitudes. This analytical approach provided insights into strengths and gaps in IPC practice at KGH and informed recommendations for improvement.

Ethical Considerations

The study adhered to the ethical principles of autonomy, beneficence, and confidentiality. Ethical approval was obtained from the Njala University Ethics Review Board, and additional permission was granted by KGH authorities.

Participation was voluntary, and respondents were informed of their right to withdraw at any time without penalty. Written informed consent was obtained prior to data collection. Confidentiality and anonymity were strictly maintained, with all data securely stored and used solely for academic purposes.

DATA PRESENTATION, ANALYSIS, AND DISCUSSION

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Contextualizing the results of any study, especially in healthcare settings, requires an understanding of the sociodemographic features of the respondents. In order to evaluate the knowledge and attitudes of healthcare professionals regarding infection prevention and control (IPC) methods at Kenema Government Hospital, 230 (92%) of the respondents in this study were healthcare workers. Age, gender, years of experience, educational background, and other pertinent traits were among the sociodemographic information gathered. Understanding how these elements may affect the nursing staff's IPC practices and gaining insight into their variety are two benefits of analyzing these variables. This demographic profile

serves as a fundamental basis for analyzing the findings and customizing treatments to target the unique requirements and difficulties encountered by various nursing workforce groups.

Table 1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Age Group	**Frequency**	**Percentage (%)**
Under 25	38	16.5%
25–34	93	40.4%
35–44	53	23.0%
45–54	37	16.1%
55 and above	9	3.9%
Total	230	100%

The largest age group among respondents was 25–34 years (40.4%), suggesting a relatively young workforce at KGH.

Table 2: Gender Distribution

Gender	**Frequency**	**Percentage (%)**
Female	128	55.7%
Male	100	43.5%
Other	2	0.8%
Total	230	100%

Majority of respondents were female (55.7%), and this is consistent with gender trends in healthcare professions especially nursing.

Table 3: Respondents by Profession

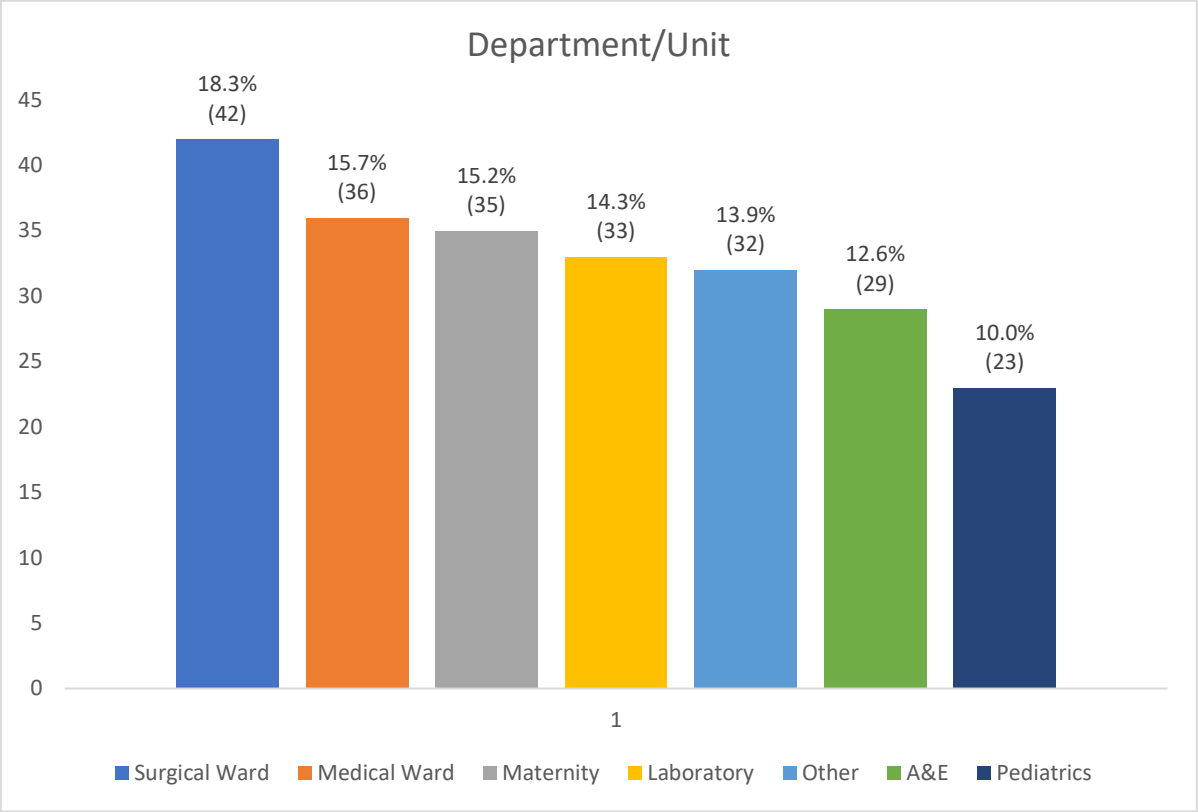
Profession	**Frequency**	**Percentage (%)**
Nurse	136	59.1%
Doctor	10	4.3%
Cleaner/Support Staff	30	13.0%
Laboratory Technician	28	12.2%
Other	26	11.4%
Total	**230**	**100%**

Nurses formed the majority professional group, accounting for over half of all participants.

Table 4: Educational Qualification

Education	**Frequency**	**Percentage (%)**
Diploma	30	13.04%
Bachelor's Degree	10	4.35%
Certificate	125	54.35%
Master's Degree	5	2.17%
Other	60	26.09%
Total	**230**	**100%**

Figure1: Department/Unit



The Surgical Ward had the highest representation among departments, followed by Medical and Maternity wards.

Table 5:Years of Experience

Years of Experience	**Frequency**	**Percentage (%)**
Less than 1 year	31	13.5%
1–5 years	83	36.1%
6–10 years	60	26.1%
More than 10 years	56	24.3%
Total	**230**	**100%**

Most respondents had between 1–5 years of experience, suggesting a mix of early and mid-career professionals.

Table 6: Formal IPC Training Received

Received IPC Training	**Frequency**	**Percentage (%)**
Yes	179	77.8%
No	51	22.2%
Total	230	100%

A significant majority (77.8%) reported having received formal IPC training, though a quarter had not a notable area for capacity building.

The population structure of the 230 participants provides background for interpreting the meaning of the study results. The participants represented a wide cross-section of health care workers (HCWs) from various departments and occupational categories at Kenema Government Hospital (KGH):

Age Profile: The majority of respondents were aged 25–34 and 35–44, indicating that the working population was largely young and dynamic.

Gender: There was a roughly even distribution between female and male HCWs, with a slight preponderance of females, as would be the case in the gender distribution in healthcare settings.

Professional Background: Nurses comprised the largest group of respondents, followed by doctors, laboratory technicians, and support staff. This is the manpower pattern in the majority of government hospitals in Sierra Leone, where nurses are the main care providers.

Education Qualification: Most of the participants possessed certificates or diplomas, reflecting a moderately to highly educationally equipped workforce. Less had bachelor's degrees and master's degrees.

Representation by Department/Unit: Participants were fairly distributed across major hospital units such as the medical and surgical wards, maternity, pediatrics, laboratory, and accident and emergency departments. This provides a realistic snapshot of IPC knowledge and practice across departments.

Years of Experience: Most respondents possessed 1–10 years of health care experience, reflecting a mix of early career and mid-career practitioners.

IPC Training: Around 70% of the respondents reported that they had attended formal IPC training, suggesting that IPC is an accepted priority but that there perhaps remains a gap for the other 30% which may require targeted education support.

In general, the demographic findings characterize a relatively young, moderately educated, and IPC-exposed workforce with variation between departments providing an appropriate setting to meaningfully interpret knowledge, attitudes, and determinants of IPC at KGH.

Knowledge of Healthcare Workers Regarding IPC Measures

Table 7**:** Responses on Knowledge of IPC Measures

Question	**Yes (%)**	**No (%)**
Have you received IPC training?	196 (85.2%)	34 (14.8%)
Do you know the WHO five moments of hand hygiene?	189 (82.2%)	41 (17.8%)
Can proper use of PPE reduce transmission of infection?	207 (90.0%)	23 (10.0%)
Are you aware that sharps must be disposed in puncture-proof bins?	202 (87.8%)	28 (12.2%)
Do you know the recommended handwashing duration?	191 (83.0%)	39 (17.0%)
Do you know standard precautions for all patient care settings?	198 (86.1%)	32 (13.9%)
Are you familiar with national IPC guidelines for Sierra Leone?	184 (80.0%)	46 (20.0%)

A large percentage of 85.2% of the population reported having been formally trained in IPC. This indicates that training programs have been established at KGH and being attended by most of the staff. The remaining 14.8% that reported not being trained indicate a possible gap, particularly for a high-risk environment where IPC compliance is necessary for staff and patient safety.

82.2% of the health care providers assured them of knowing the five World Health Organization's hand hygiene moments. It is a good finding, since hand hygiene is one of the most cost-effective IPC interventions. Close to 18% of the respondents lacked this vital information, suggesting the need to re-emphasize basic IPC basics in training and supervision.

In additional support, a strong 90% of respondents admitted that proper application of personal protective equipment (PPE) reduces the spread of infection. This high level of awareness is comforting, even more so given PPE's central role in outbreaks such as COVID-19 and Ebola, which further highlights its importance. However, the 10% who responded negatively risk compromising overall IPC performance if addressed.

For proper disposal of sharps, 87.8% of the participants knew they need to be disposed in puncture-proof containers. This is a critical measure in preventing needle-stick injuries and reducing exposure to blood-borne disease-causing pathogens. However, with 12.2% having no idea or being in doubt, there continues to be an enormous risk factor in daily clinical practice.

Awareness of the proper handwashing time was expressed by 83% of the healthcare workers. This is sufficient, though less than optimal, considering how much proper handwashing has to do with interrupting the chain of infection.

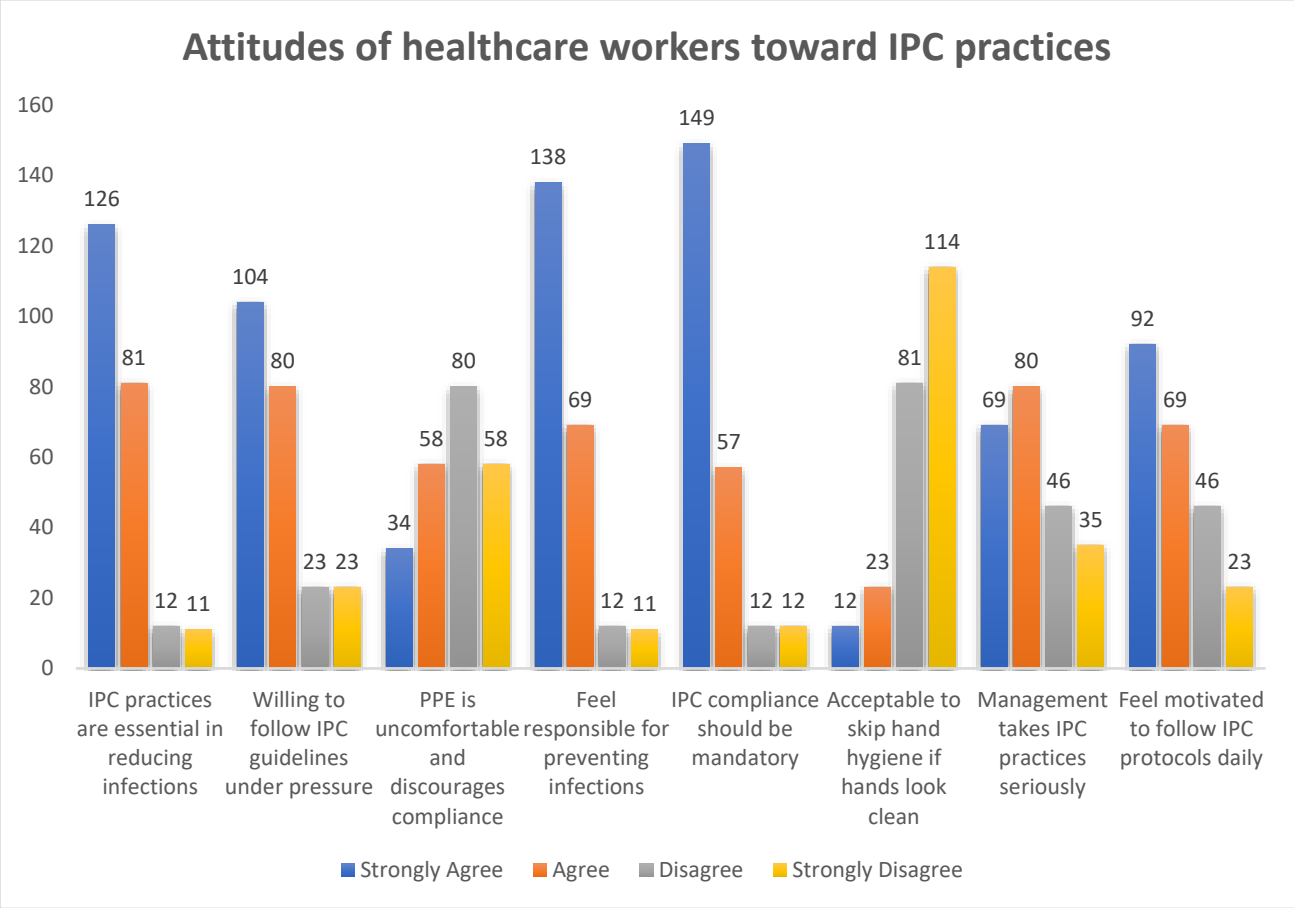
In the misconception category that IPC protocols are meant for periods of outbreaks only, 84.8% of the participants disagreed (50.0%) or strongly disagreed (34.8%). This shows a majority understanding IPC as a normal, not crisis-focused,

requirement. However, 15.2% agreed or strongly agreed, which could reflect a trend to reduce IPC standards during non-outbreak periods, an inclination that could contribute to healthcare-associated infections (HAIs).

Furthermore, 86.1% of the respondents were aware of the standard precautions applied in all patient care settings, reaffirming the perception that most HCWs have knowledge about IPC basics. Finally, 80% of respondents claimed familiarity with Sierra Leone's national IPC guidelines, whereas this represents high policy dissemination; the remaining 20% reaffirms the need for continuous orientation, particularly for new staff members or those working in lower-resource departments.

Overall, knowledge among HCWs in KGH remains fairly good, but there is always a core of missing information on most measures. These gaps, while not ubiquitous, are significant enough to suggest refresher training aimed at them particularly, enhanced supervision, and incorporation of IPC material into normal staff development activities. Filling these gaps will help to improve the overall IPC practice and safety culture of the hospital.4.3. Attitudes of Healthcare Workers toward IPC Practices

Figure 2: Attitudes of healthcare workers toward IPC practices



For the statement that IPC practices are necessary to reduce infection in hospitals, a large proportion of respondents either strongly agreed (54.8%) or agreed (35.2%) (Table 9), implying that HCWs understand the need for IPC practices in hospital settings to protect both patients and staff from infection. A very low minority (10%) indicated the contrary, demonstrating an overall awareness to the importance of IPC.

When questioned about their unwillingness to comply to the IPC recommendations under pressure, 80% of HCWs answered positively (45.2% strongly agreed and 34.8% agreed). Twenty percent of the HCPs reported hesitance or

difficulty when faced with a stressful situation, which indicates that time-pressure and workload are likely to influence full compliance.

Opinions of PPE use, as reflected, were split. Although 50% of participants disagreed or strongly disagreed that PPE is uncomfortable and makes them not want to comply, a striking 40% agreed or strongly agreed. This division reveals a potential obstacle to regular PPE use that is found to be unappealing or uncomfortable during normal activities and should be countered in improved ways of PPE design, training or management enforcement.

The scores from responses related to attitude revealed very positive attitudes in this domain as a high percentage of the HCWs felt responsible for infection prevention in their work area. This is a good sign as it means that the HCWs would be likely to take ownership of IPC in their setting because 90% of the respondents either agreed or strongly agreed with the statement (60% strongly agreed, 30% agreed). This finding suggests the HCWs' accountability and responsibility in their work place, which are essential qualities for the sustainability of IPC practices in the health facilities.

Responses in a similar category item show near-unanimous agreement among the HCWs that the IPC practices compliance should be made a mandatory requirement. This is based on the fact that 89.6% of the HCWs either agreed or strongly agreed that the IPC should be made a mandatory requirement in their setting. This finding suggests that the HCWs are quite receptive to a policy of enforcement or a possible institutional standardization of IPC requirements.

In contrast, I discovered an undesirable perception among the HCWs regarding non-compliance of IPC practices. 15.2% of the HCWs either strongly agreed or agreed with a statement, "It is okay to skip hand hygiene if the hands look clean", which is against the standard IPC guidelines. This finding suggests the possible need for further behavior change communication among the HCWs with regards to the concept that our hands could still be harboring dangerous microorganisms even if they are visibly clean.

Perceptions with regards to an institutional factor showed that only 64.8% of the HCWs (30% strongly agreed and 34.8% agreed) felt that the management in their health facilities took IPC seriously, while the other 35.2% (22.4% disagreed and 12.8% strongly disagreed) were of the contrary opinion. This relatively high percentage of respondents who felt that the management did not take IPC seriously in their health facilities could lead to the loss of morale and motivation among the HCWs. It, therefore, means that leadership should visibly support IPC and continually encourage the workers to take it seriously in order to gain their trust and keep them accountable.

70% of the HCWs agreed that they were motivated daily to follow IPC procedures in their work places, however, 30% of the HCWs were not always motivated. This further reiterates the importance of the need for constant supervision and positive reinforcement among the HCWs in order to improve their work environments and help make IPC behavior sustainable.

Factors Influencing Knowledge and Attitudes on IPC

Figure 3: Factors Influencing Knowledge and Attitudes on IPC

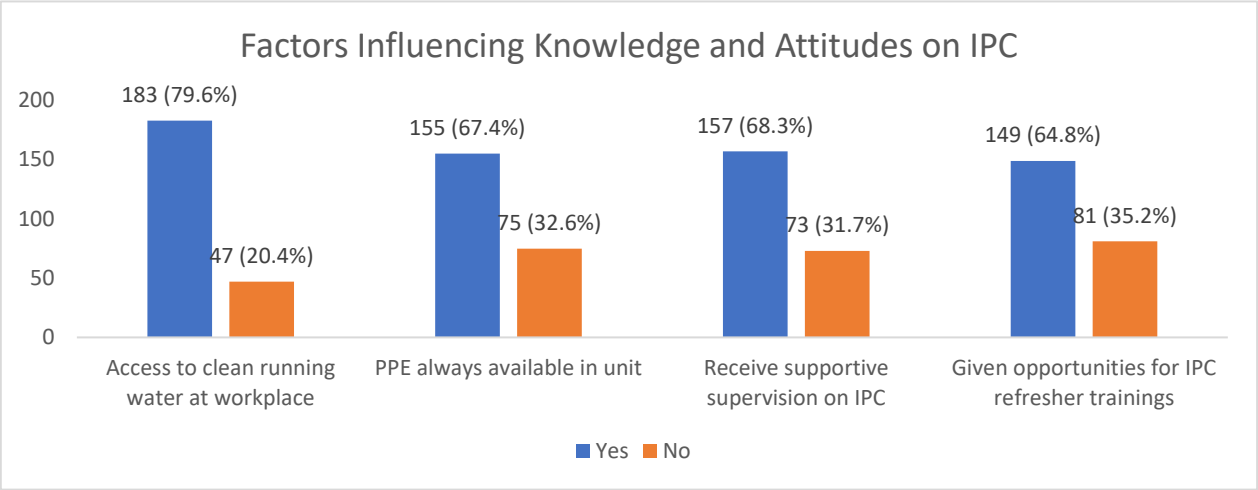
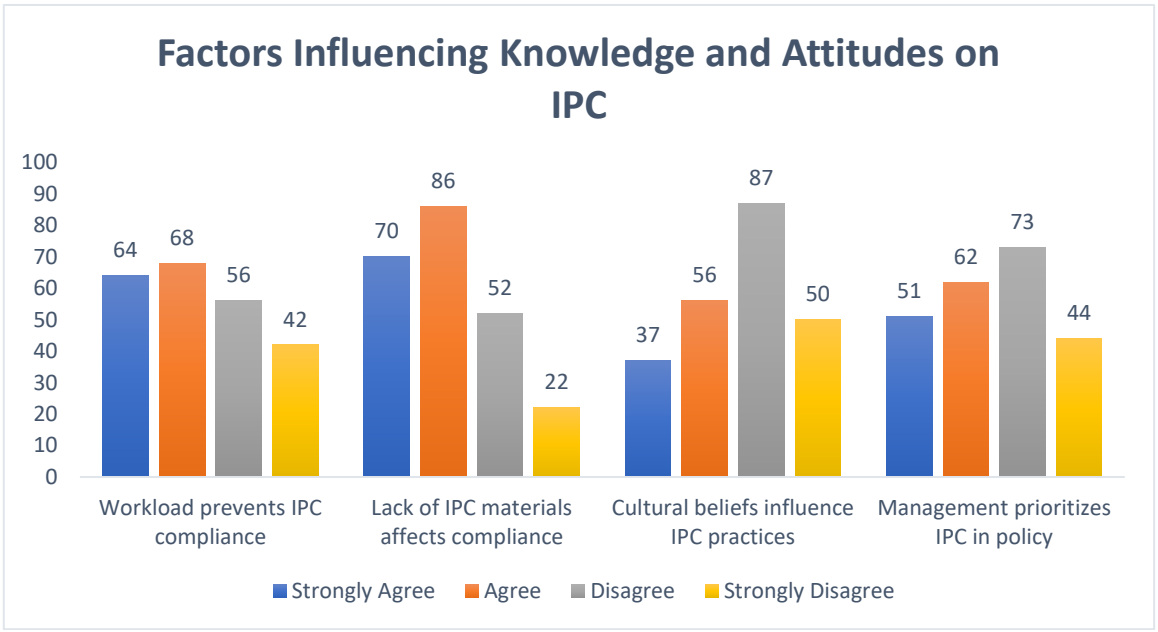


Figure 4: **Factors Influencing Knowledge and Attitudes on IPC**



Most of the respondents (79.6%) indicated the presence of clean running water in their work setting, which is most critical for hand hygiene adherence. However, 20.4% indicated otherwise suggesting infrastructural deficits that could affect IPC adherence. A slightly lower percentage (67.4%) indicated utilization of the available Personal Protective Equipment (PPE) in their units while nearly a third (32.6%) lacked regular availability. This is concerning, considering the lack of PPE directly hinders compliance, especially in the event of high-risk procedures or outbreaks.

In addition, 68.3% of the respondents reported receiving supportive supervision for IPC practice but 31.7% did not receive supportive supervision. Supportive supervision plays a key role in reminding the staff of correct IPC protocols and providing immediate feedback. Similarly, a mere 64.8% reported receiving opportunities to attend IPC refresher training, which means that over a third of the staff do not receive crucial updates and reminders of IPC guidelines.

For items with a Likert scale, 57.4% of the respondents (27.8% strongly agree and 29.6% agree) felt that workload hinders their adherence to IPC protocols on a regular basis. This is a significant operational constraint that can be overcome through staffing solutions and workload distribution.

The impact of limitations in resources is observed, where 67.8% (30.4% strongly agree, 37.4% agree) concurred that lack of IPC materials hinders compliance. This mirrors the chronic challenge of the supply of logistics in the healthcare facility in low-resource settings.

Furthermore, cultural influences on IPC practice were also received with a split response. While 40.4% agreed that cultural beliefs influence IPC practice, they were more at 59.5% who disagreed or strongly disagreed. This indicates that culture influences some of the staff but perhaps not hospitalwide.

Finally, under the aspect of institutional support, 49.2% of the participants affirmed that hospital management places due significance on IPC in policy, while 50.8% disagreed or strongly disagreed. This can influence staff motivation and responsibility, and demands more overt and sustained leadership in implementing IPC.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study was conducted to assess the knowledge and attitudes of healthcare workers (HCWs) regarding infection prevention and control (IPC) practices at Kenema Government Hospital (KGH), a major tertiary referral center in eastern Sierra Leone. The study was informed by three primary objectives: to assess the level of knowledge among HCWs regarding IPC, to determine their attitudes towards IPC practices, and to identify variables that influence these two factors.

A standardized questionnaire was completed by a sample of 250 health-care workers, from whom 230 responses were received and analyzed. Data were categorized into four general sections: demographic information, knowledge, attitudes, and determinants. Demographic section results showed that the respondents represented a wide range of ages, occupations, and departmental groupings, with nurses and mid-level personnel dominating. Most of the respondents had received some form of formal IPC training.

Knowledge Analysis established that HCWs employed at KGH were inclined to demonstrate high perception of IPC measures such as proper hand hygiene, the use of PPE, disposal of sharps, and national policies. Gaps in knowledge were also found concerning the timing and relevance of IPC during non-outbreak situations.

For beliefs, it showed that most respondents, albeit slightly lower, strongly believed that IPC is essential to patient safety and infection prevention. They would adhere to IPC guidelines even in circumstances where they were under pressure and took personal responsibility for infection prevention. However, resistances such as hesitation with PPE and perceived lack of interest on the part of managers towards IPC were observed.

The underlying factors were revealed systemic and institutional concerns like variable access to PPE, inadequate supervision, and absence of IPC refresher training. Workload and inadequate IPC material were identified as main hindrances to compliance. Surprisingly, the middle field of responses was that only management perceived that IPC was a priority within hospital policy.

5.2 Conclusion

The findings of this research confirm that there exists a good level of knowledge and positive attitudes among the health workers at Kenema Government Hospital regarding the implementation of IPC procedures. However, there are various systemic and logistics challenges that prevent the use of this knowledge universally in practice.

While the overwhelming majority of HCWs acknowledge the worth of IPC, their ability to put best practices into action is frequently hindered by insufficient resources and skilled assistance, combined with heavy workloads and inconsistent administrative support. Such impediments represent knowledge-action gaps that can undermine infection prevention activities and encourage HAIs.

This study therefore emphasizes the necessity of addressing not just attitudes and knowledge, but also the facilitative environment in which healthcare staff function. Hospitals need to provide ongoing training, adequate resources, and facilitating policies to allow practical adherence to IPC standards for IPC to be most effective.

Recommendations

Based on the findings of this study, four key recommendations are put forward for consideration by relevant stake holders and they include:

For the Government**:** The government should prioritize sustainable financing of infection prevention and control (IPC) by ensuring continuous provision of essential supplies such as gloves, masks, gowns, disinfectants, and reliable water systems in all healthcare facilities. National policies must also integrate IPC compliance as a mandatory standard across both public and private hospitals.

For Hospital Management**:** Hospital administrators should institutionalize IPC policies within their facilities and make them part of routine performance appraisals and audits. In addition, visible managerial support is needed through regular supervision, designation of departmental IPC focal persons, and recognition systems that reward departments and staff demonstrating exemplary compliance.

For Community Health Workers (CHWs): CHWs should be regularly engaged in refresher training programs and workshops tailored to their specific roles in promoting IPC. As frontline health promoters, they can also drive behavior change communication campaigns within both health facilities and communities, helping to dispel myths and encourage consistent adherence to safe practices.

For Further Research**:** Future studies should expand to rural health facilities and compare IPC practices between public and private institutions. Using qualitative methods such as interviews and focus group discussions could generate deeper insights into the perceptions, challenges, and behaviors of healthcare workers regarding IPC.

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