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# KNOWLEDGE, ATTITUDE, AND PRACTICE REGARDING PREVENTION OF HOSPITAL ACQUIRED INFECTIONS AMONGST HEALTH WORKERS IN NIGERIAN TERTIARY HOSPITALS: A NARRATIVE SYNTHESIS (2000-2025)

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#### Authors' contributions

This study was a collaborative effort among all authors. Each author reviewed and approved the final version of the manuscript for publication.

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#### ABSTRACT

**Background:** Hospital infections (HAIs) pose a significant threat to patient safety and increase healthcare costs, particularly in low- and middle-income countries like Nigeria. This review synthesize evidence from peer-reviewed literature (2000-2025) on the KAP of HCWs towards HAI prevention in Nigerian tertiary hospitals, identify barriers and facilitators influencing IPC compliance, and provide context on HAI prevalence and impact in this setting.

**Methods:** A narrative synthesis approach of Peer-reviewed articles, reviews, and reports published between January 2000 and May 2025 focusing on HCW KAP regarding HAI/IPC in Nigerian tertiary hospitals were identified through targeted searches. Data on KAP levels, specific practices, variations across cadres, barriers/facilitators, and HAI context (prevalence, types, and impact) were extracted and synthesized thematically. No formal protocol registration was undertaken for this narrative synthesis.

**Results:** HCWs generally demonstrated adequate-to-good knowledge (median scores often >90% in some studies and positive attitudes (median scores >90% towards IPC. However, critical knowledge gaps exist, particularly concerning sharps safety (e.g., only 47.7% knew sharps should never be recapped and specific hand hygiene applications. A significant "KAP gap" was evident, with practice levels (median score 50.8% in one study lagging considerably behind knowledge and attitudes. Specific practice deficiencies included inconsistent hand hygiene, alarmingly high rates of needle recapping (e.g., 33.7% usually recap 95.1% of doctors in another study, variable PPE use often linked to availability, and poor waste management. KAP levels varied by HCW cadre and experience, with junior staff often showing lower scores. Key barriers identified were predominantly systemic: resource constraints, inadequate staffing/high workload, training deficiencies, weak institutional

support/governance, and inadequate infrastructure and policy implementation gaps. Facilitators included resource availability, effective training, leadership support, functional IPC infrastructure, and monitoring/feedback.

**Conclusion:** Improving HAI prevention in Nigerian tertiary hospitals requires a multi-faceted approach prioritizing the resolution of systemic barriers alongside reinforcing HCW knowledge and positive attitudes through effective, practical training and supportive institutional policies.

Keywords: Hospital-Acquired infections (HAI), KAP, HCWs, Nigeria, Tertiary Hospitals.

#### INTRODUCTION

Hospital-acquired infections (HAIs), also known as nosocomial or Healthcare-Associated Infections (HCAIs), are a major global public health issue and a significant threat to patient safety (Bayiyana, 2023; Khatrawi *et al.*, 2023; Nikuze *et al.*, 2022; Ogoina *et al.*, 2015). They contribute to increased patient morbidity and mortality, longer hospital stays, and higher healthcare costs worldwide (Lin *et al.*, 2008; Nejad *et al.*, 2017; Olorunmoteni *et al.*, 2023; Ogoina *et al.*, 2015; WaterAid, 2024). The burden is disproportionately higher in low- and middle-income countries (LMICs), including Nigeria, where the risk can be 2 to 20 times greater than in high-income nations (Bayiyana, 2023; Mbim *et al.*, 2018; Nejad *et al.*, 2017; Olowo *et al.*, 2023). Factors contributing to this include limited resources, inadequate staffing, overcrowding, poor hygiene and infrastructure, and weaker implementation of Infection Prevention and Control (IPC) practices (Ellasus & Lopez, 2024; Olowo *et al.*, 2023; Cummings *et al.*, 2019; Nikuze *et al.*, 2022). A significant portion of HAIs are preventable through effective IPC measures (Nejad *et al.*, 2017; Ogunsola *et al.*, 2011; Olowo *et al.*, 2023; Owusu *et al.*, 2024).

#### Rationale

Healthcare workers (HCWs) are central to HAI transmission and prevention due to their direct patient contact and interaction with the healthcare environment (Oche *et al.*, 2024; Ogunsola *et al.*, 2011). HCW compliance with IPC measures, especially standard precautions, is fundamental (Alreshidi, 2022; Ellasus & Lopez, 2024; Mng'ong'o *et al.*, 2023; Nikuze *et al.*, 2022; Ogoina *et al.*, 2015; Rochmawati *et al.*, 2021). The Knowledge, Attitude, and Practice (KAP) framework helps understand HCW behaviour (Ellasus & Lopez, 2024; Obeagu *et al.*, 2021; Ogoina *et al.*, 2015; Tegegne *et al.*, 2021). Poor knowledge can lead to delayed diagnosis and poor practices (Karim *et al.*, 2022; Obeagu *et al.*, 2021; Tegegne *et al.*, 2021), while negative attitudes can undermine compliance (Ellasus & Lopez, 2024; Karim *et al.*, 2022). Assessing KAP is crucial for designing effective IPC strategies (Ogoina *et al.*, 2015; Kumar *et al.*, 2021). Understanding the specific context in Nigerian tertiary hospitals, including HAI prevalence, types, impact, and the factors influencing HCW KAP, is essential for targeted improvements This narrative synthesis aims to: Summarize the evidence from peer-reviewed literature (2000-2025) on the Knowledge, Attitude, and Practice (KAP) of HCWs regarding HAI prevention in Nigerian tertiary hospitals. Identify specific strengths and weaknesses in KAP among these HCWs. Examine variations in KAP across different HCW cadres and experience levels. Analyze the barriers and facilitators influencing IPC compliance in this setting. Provide context on the prevalence, types, and impact of HAIs in Nigerian tertiary hospitals.

## METHODS

**Protocol and Registration**: This study employed a narrative synthesis approach. As a narrative synthesis based on readily available literature identified through targeted searches, no formal protocol was registered on platforms like PROSPERO.

**Eligibility Criteria**: Studies were included if they were peer-reviewed articles, systematic reviews, meta-analyses, or relevant reports published in English between January 1, 2000, and May 2, 2025. They needed to focus on HCWs (various cadres) in Nigerian tertiary hospitals or provide relevant comparative data from similar LMIC contexts. Studies had to assess KAP related to HAI/IPC/standard precautions or provide data on HAI prevalence, types, impact, or barriers/facilitators in the specified context. Studies focusing solely on non-tertiary settings (unless providing comparison (Oladele *et al.*, 2022)), non-HCWs, outside the date range, or non-English studies were excluded. Studies solely on MERS-CoV or SARS-CoV were excluded unless discussing generally applicable IPC principles (Tegegne *et al.*, 2021).

**Information Sources**: The synthesis drew upon information retrieved from various sources, implicitly including databases like PubMed/MEDLINE, AJOL, Google Scholar.

**Search Strategy**: The search strategy involved identifying relevant literature using keywords and concepts such as: "Knowledge Attitude Practice" (KAP), "Hospital Acquired Infection" (HAI), "Nosocomial Infection", "Healthcare-Associated Infection" (HCAI), "Infection Prevention and Control" (IPC), "Standard Precautions", "Healthcare Workers" (HCWs), "Nurses", "Doctors", "Medical Students", "Nigeria", "Tertiary Hospitals", "Teaching Hospitals", barriers, facilitators, prevalence, impact, costs, and specific infection types (e.g., UTI, SSI).

**Selection Process**: Relevant studies were selected based on their alignment with the eligibility criteria and their direct contribution to understanding HCW KAP, HAI context, or influencing factors within Nigerian tertiary hospitals or comparable settings.

**Data Collection Process**: Information was extracted narratively from the selected literature by identifying key themes relevant to the study objectives.

Data Items: Data extraction focused on:

KAP Levels: Quantitative (scores, percentages) and qualitative descriptions.

**Specific KAP Areas:** Strengths/weaknesses in knowledge (hand hygiene, sharps safety), attitudes (risk perception), and practices (compliance rates, specific behaviours like recapping).

Variations: Differences based on HCW cadre, experience, education.

Barriers and Facilitators: Systemic/institutional and individual/team factors.

HAI Context: Prevalence rates, common types (UTI, SSI), impact (morbidity, mortality, costs, length of stay), pathogens.

**Study Risk of Bias Assessment**: A formal risk of bias assessment for each included study was not conducted, which is typical for a narrative synthesis. However, the heterogeneity of methodologies, assessment tools, and definitions across studies is acknowledged as a limitation affecting direct comparability.

**Synthesis Methods**: A narrative synthesis approach was used. Extracted information was grouped thematically under the IMRAD structure adapted for SWiM (Introduction, Methods, Results, Discussion). Findings were summarized descriptively, incorporating quantitative data where available. Key findings related to KAP levels, specific practices, and barriers/facilitators were also presented.

**Limitations of the Methods**: This synthesis relies on the available literature identified. Potential limitations include: **Heterogeneity:** Variations in study design, tools, and definitions limit direct comparisons.

Publication Bias: Potential overrepresentation of studies with significant or positive findings.

Data Gaps: Limited information on certain aspects (e.g., detailed costs, standardized surveillance).

Generalizability: Findings from specific institutions may not apply universally across all Nigerian tertiary hospitals.

## RESULTS

**Study Selection**: This synthesis is based on the information extracted from the provided set of researches (n=61), which included original studies (cross-sectional, audits), systematic reviews, meta-analyses, reports, and commentaries relevant to the objectives.

**Study Characteristics**: The synthesized evidence comes from studies conducted primarily in Nigerian tertiary hospitals (Iliyasu *et al.*, 2015; Ndibuagu *et al.*, 2022; Obeagu *et al.*, 2021; Oche *et al.*, 2024; Ogoina *et al.*, 2015; Ogunsola *et al.*, 2011; Okpetu *et al.*, 2023; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022), with comparative or contextual data from other LMICs (e.g., Ethiopia (Alemu *et al.*, 2021; Angamo *et al.*, 2023; Hussen *et al.*, 2017), Rwanda (Nikuze *et al.*, 2022), Tanzania (Mng'ong'o *et al.*, 2023), Uganda (Bayiyana, 2023)) and global reviews (Khatrawi *et al.*, 2023; Owusu *et al.*, 2024; Rochmawati *et al.*, 2021; Tegegne *et al.*, 2021). Study designs included cross-sectional surveys, audits, qualitative studies, systematic reviews, and meta-analyses. Participants primarily included doctors, nurses, medical students, laboratory scientists, and other HCWs.

#### Synthesis of Results

## Knowledge of HAI Prevention among Healthcare Workers

- Overall Knowledge Levels: Knowledge was often reported as adequate or high in tertiary settings (Iliyasu *et al.*, 2015; Ogoina *et al.*, 2015), with median scores sometimes exceeding 90% (Ogoina *et al.*, 2015). General awareness of IPC/standard precautions was high (Ogoina *et al.*, 2015; Okpetu *et al.*, 2023). However, significant variability exists, with some Nigerian studies showing lower levels (e.g., 64.4% adequate knowledge among nurses (Obeagu *et al.*, 2021)) and very low levels reported elsewhere (e.g., 20.3% knowledgeable in Trinidad & Tobago (Khatrawi *et al.*, 2023)). Global reviews during COVID-19 showed a median of 75.8% good knowledge (Tegegne *et al.*, 2021).
- Specific Knowledge Areas: Strengths included recognizing handwashing importance (Iliyasu *et al.*, 2015) and basic standard precautions (Iliyasu *et al.*, 2015; Ogoina *et al.*, 2015). Major weaknesses were consistently found in **sharps** safety (only 47.7% knew not to recap (Ogoina *et al.*, 2015); 41.8% believed recapping was correct (Okpetu *et al.*, 2023)), specific hand hygiene applications (when/how long) (Ogoina *et al.*, 2015; Okpetu *et al.*, 2023), bloodborne pathogen risks (Iliyasu *et al.*, 2015), waste segregation (Oche *et al.*, 2024), and instrument decontamination (Oche *et al.*, 2024).
- Variations Across HCW Cadres: Knowledge generally improved with experience and seniority (Alemu *et al.*, 2021; Nikuze *et al.*, 2022; Ogoina *et al.*, 2015; Tegegne *et al.*, 2021). Junior staff (house officers, junior nurses, MLS) often had lower scores (Ogoina *et al.*, 2015). Nurses sometimes showed better knowledge than doctors in specific areas (Iliyasu *et al.*, 2015). Medical students had gaps in practical knowledge (Oche *et al.*, 2024).

• Factors Associated with Knowledge: Prior training was strongly linked to better knowledge (Alemu *et al.*, 2021; Ogoina *et al.*, 2015; Tegegne *et al.*, 2021). Higher education level (Nikuze *et al.*, 2022; Oladele *et al.*, 2022; Tegegne *et al.*, 2021) and longer experience (Alemu *et al.*, 2021; Nikuze *et al.*, 2022; Ogoina *et al.*, 2015; Tegegne *et al.*, 2021) were also associated factors. Reliable information sources were beneficial (Karim *et al.*, 2022; Oladele *et al.*, 2022; Tegegne *et al.*, 2022; Tegegne *et al.*, 2022; Tegegne *et al.*, 2022; Tegegne *et al.*, 2021).

## Attitudes of Healthcare Workers Towards HAI Prevention

**General Attitudes:** Attitudes were generally reported as positive (Bayiyana, 2023; Ellasus & Lopez, 2024; Hussen *et al.*, 2017; Nikuze *et al.*, 2022; Obeagu *et al.*, 2021; Ogoina *et al.*, 2015; Tegegne *et al.*, 2021), with median scores often >90% (Ogoina *et al.*, 2015). Most believed precautions were effective (Ogoina *et al.*, 2015) and acknowledged infection risks (Bayiyana, 2023).

**Specific Attitudes Indicating Potential Issues:** Negative attitudes surfaced regarding **sharps safety**, with 39% disagreeing sharps should never be recapped and 13.4% feeling bending/breaking was acceptable (Ogoina *et al.*, 2015). Some felt handwashing after touching surroundings was unnecessary (7% (Ogoina *et al.*, 2015)). Potential complacency regarding personal risk existed (Bayiyana, 2023; Ogoina *et al.*, 2015).

Variations Across HCW Cadres: House officers showed significantly lower attitude scores compared to senior colleagues (Ogoina *et al.*, 2015).

**Factors Associated with Attitudes:** Positive attitudes correlated with good knowledge (Oladele *et al.*, 2022; Tegegne *et al.*, 2021), prior **training** (Ogoina *et al.*, 2015), higher **education** (Alemu *et al.*, 2021; Nikuze *et al.*, 2022; Oladele *et al.*, 2022; Tegegne *et al.*, 2021), longer experience (Alemu *et al.*, 2021; Nikuze *et al.*, 2022), and good practice (Ellasus & Lopez, 2024; Nikuze *et al.*, 2022; Tegegne *et al.*, 2022).

## Practices of Healthcare Workers in HAI Prevention

**Overall Practice Levels and the KAP Gap:** A significant gap exists between knowledge/attitude and practice (Alemu *et al.*, 2021; Bayiyana, 2023; Hussen *et al.*, 2017; Obeagu *et al.*, 2021; Ogoina *et al.*, 2015). Practice levels consistently lag, with median scores often around 50-60% or lower (Alemu *et al.*, 2021; Hussen *et al.*, 2017; Khatrawi *et al.*, 2023; Nikuze *et al.*, 2022; Oche *et al.*, 2024; Ogoina *et al.*, 2015; Olowo *et al.*, 2023). Practice is the critical bottleneck (Bayiyana, 2023; Ogoina *et al.*, 2015).

## Specific IPC Practices:

**Hand Hygiene:** Compliance is often suboptimal and inconsistent across different moments/indications (Iliyasu *et al.*, 2015; Mng'ong'o *et al.*, 2023; Oche *et al.*, 2024; Ogoina *et al.*, 2015). Availability of supplies is a key determinant (Mng'ong'o *et al.*, 2023; Nikuze *et al.*, 2022; Olowo *et al.*, 2023). Forgetting is also cited (Ndibuagu *et al.*, 2022).

**PPE Use:** Highly variable, strongly dependent on availability and risk perception (Ndibuagu *et al.*, 2022; Oche *et al.*, 2024). Unavailability and cost are major barriers (Ndibuagu *et al.*, 2022; Oche *et al.*, 2024). Skills gaps exist (Rochmawati *et al.*, 2021).

**Sharps Safety:** Practices are consistently poor. Needle recapping is alarmingly common across studies (Hussen *et al.*, 2017; Iliyasu *et al.*, 2015; Ndibuagu *et al.*, 2022; Ogoina *et al.*, 2015). Proper disposal is also inconsistent (Ogoina *et al.*, 2015).

**Waste Management:** Often inadequate (Bayiyana, 2023; Ellasus & Lopez, 2024; Hussen *et al.*, 2017; Olowo *et al.*, 2023), linked to knowledge gaps (Oche *et al.*, 2024) and infrastructure issues (Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022).

Environmental Cleaning/Instrument Decontamination: Deficiencies noted (Hussen *et al.*, 2017; Olowo *et al.*, 2023), e.g., poor stethoscope cleaning (Oche *et al.*, 2024).

Variations in Practice Across HCW Cadres: Junior staff often show lower compliance (Ogoina *et al.,* 2015). Differences exist between doctors and nurses (Iliyasu *et al.,* 2015; Mng'ong'o *et al.,* 2023).

**Factors Associated with Practice:** Influenced by individual factors (attitude, knowledge, training, forgetting) (Ellasus & Lopez, 2024; Ndibuagu *et al.*, 2022; Nikuze *et al.*, 2022; Okpetu *et al.*, 2023; Tegegne *et al.*, 2021) but dominated by systemic/environmental factors (resource availability, work environment, institutional support, infrastructure) (Alreshidi, 2022; Mhlongo *et al.*, 2022; Mng'ong'o *et al.*, 2023; Ndibuagu *et al.*, 2022; Nikuze *et al.*, 2022; Okpetu *et al.*, 2022; Ogoina *et al.*, 2015; Okpetu *et al.*, 2023; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Peters *et al.*, 2022).

#### Barriers and Facilitators to Effective HAI Prevention Practices

Systemic and Institutional Barriers: These are the most significant impediments.

**Resource Constraints:** Pervasive lack of PPE, hand hygiene supplies/facilities, general materials, and dedicated IPC funding (Mhlongo *et al.*, 2022; Ndibuagu *et al.*, 2022; Oche *et al.*, 2024; Ogoina *et al.*, 2015; Okpetu *et al.*, 2023; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Peters *et al.*, 2022; WaterAid, 2024; Federal Ministry of Health Nigeria, n.d.).

**Inadequate Staffing/High Workload:** Chronic understaffing, excessive workload, and overcrowding hinder compliance (Mhlongo *et al.*, 2022; Ogoina *et al.*, 2015; Okpetu *et al.*, 2023; Olowo *et al.*, 2023; Cummings *et al.*, 2019).

**Training Deficiencies:** Lack of regular, effective, practical, or pre-employment training (Karim *et al.*, 2022; Ogoina *et al.*, 2015; Okpetu *et al.*, 2023; Olowo *et al.*, 2023; Peters *et al.*, 2022; RKI & NCDC, 2024). Didactic methods often ineffective (RKI & NCDC, 2024).

Weak Institutional Support/Governance: Lack of management support/engagement, poor national/facility IPC governance, non-functional/absent IPC committees, poor communication, lack of monitoring/feedback (Mhlongo *et al.*, 2022; Ogoina *et al.*, 2015; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Peters *et al.*, 2022; Cummings *et al.*, 2019).

**Inadequate Infrastructure/Environment:** Poor WASH facilities, waste management, space constraints (isolation, overcrowding), equipment maintenance issues (Bayiyana, 2023; Ellasus & Lopez, 2024; Hussen *et al.*, 2017; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Cummings *et al.*, 2019; Okpetu *et al.*, 2023; WaterAid, 2024).

**Policy and Guideline Issues:** Lack of facility-specific guidelines, poor adherence, weak implementation of national policies (Policy-Practice Gap) (Bayiyana, 2023; Ellasus & Lopez, 2024; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Peters *et al.*, 2022; RKI & NCDC, 2024).

Individual and Team Barriers: Include specific knowledge gaps (Iliyasu *et al.*, 2015; Ndibuagu *et al.*, 2022; Ogoina *et al.*, 2015; Okpetu *et al.*, 2023; Lin *et al.*, 2008), negative attitudes/beliefs (Ogoina *et al.*, 2015), behavioural factors like forgetting or time constraints (Mhlongo *et al.*, 2022; Ndibuagu *et al.*, 2022; Ogoina *et al.*, 2015), poor team dynamics/communication (Mhlongo *et al.*, 2022; Osemwenkha *et al.*, 2022), and fear/stigma (Karim *et al.*, 2022).

Identified Facilitators: Include consistent resource availability (Mng'ong'o et al., 2023; Nikuze et al., 2022; Olowo et al., 2023), effective training (Alemu et al., 2021; Ellasus & Lopez, 2024; Karim et al., 2022; Nikuze et al., 2022; Ogoina et al., 2015; Olowo et al., 2023; Oladele et al., 2022; RKI & NCDC, 2024; Tegegne et al., 2021), strong

**leadership/management support** (Mhlongo *et al.*, 2022; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022), functional IPC infrastructure (committees, guidelines) (Ogoina *et al.*, 2015; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Peters *et al.*, 2022; Cummings *et al.*, 2019), monitoring and feedback (Olowo *et al.*, 2023; Cummings *et al.*, 2019), adequate staffing, professional experience (Alemu *et al.*, 2021; Nikuze *et al.*, 2022; Ogoina *et al.*, 2015; Tegegne *et al.*, 2021), and positive **attitudes** (Ellasus & Lopez, 2024; Nikuze *et al.*, 2022).

## DISCUSSION

This narrative synthesis reveals a persistent and concerning gap between the generally adequate knowledge and positive attitudes of HCWs towards IPC and their actual practices in Nigerian tertiary hospitals (Alemu *et al.*, 2021; Bayiyana, 2023; Hussen *et al.*, 2017; Obeagu *et al.*, 2021; Ogoina *et al.*, 2015). While general awareness exists, critical deficiencies in specific knowledge areas (especially sharps safety (Ogoina *et al.*, 2015; Okpetu *et al.*, 2023)) and suboptimal practices (inconsistent hand hygiene, prevalent needle recapping (Iliyasu *et al.*, 2015; Ndibuagu *et al.*, 2022; Ogoina *et al.*, 2015)) are widespread. The normalization of unsafe practices like recapping is a major concern (Ndibuagu *et al.*, 2022). The evidence strongly suggests that systemic and institutional barriers—resource scarcity, staffing shortages, inadequate training, weak governance, poor infrastructure, and policy implementation gaps—are the dominant factors hindering effective IPC, often overriding individual HCW knowledge and intentions (Mhlongo *et al.*, 2022; Ogoina *et al.*, 2015; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2015). HAIs impose a significant burden in Nigeria, with high prevalence rates (Angamo *et al.*, 2023; Mbim *et al.*, 2018; Nejad *et al.*, 2017; Ogunsola *et al.*, 2011; Owusu *et al.*, 2024; WaterAid, 2024), and considerable economic costs (Lin *et al.*, 2008; Olorunmoteni *et al.*, 2023; WaterAid, 2024).

## Limitations

Key limitations include the heterogeneity of study designs, tools, and definitions across the synthesized literature, making direct comparisons difficult. Potential publication bias may exist, and data gaps persist for certain aspects. Findings from specific institutions may not be fully generalizable to all Nigerian tertiary hospitals.

#### **Implications for Practice and Policy**

Addressing the KAP gap and reducing HAIs requires a multi-level approach:

- **Policymakers/National Bodies (FMOH/NCDC):** Must strengthen national IPC governance, oversight, and funding, ensuring policies translate into practice. Mandating standardized HAI surveillance and promoting effective, participatory training models are crucial (Federal Ministry of Health Nigeria, n.d.; Ogunsola *et al.*, 2011; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; RKI & NCDC, 2024; WaterAid, 2024).
- **Hospital Management:** Needs to demonstrate visible leadership, ensure consistent resource availability (IPC supplies, WASH infrastructure), address staffing/workload issues, empower functional IPC committees, implement robust monitoring/feedback systems (using CQI), mandate comprehensive training, and improve communication (Mhlongo *et al.*, 2022; Ogoina *et al.*, 2015; Olowo *et al.*, 2023; Osemwenkha *et al.*, 2022; Peters *et al.*, 2022).
- IPC Teams/Educators: Should develop targeted training addressing key gaps (sharps safety, hand hygiene) using effective methods, implement multimodal behaviour change strategies, conduct regular audits with feedback, and ensure guideline clarity/accessibility (Olowo *et al.,* 2023; RKI & NCDC, 2024).
- Healthcare
- Workers: Need to prioritize adherence, engage in continuous learning, and advocate for a safe environment.

#### Implications for Research

Further research is needed:

- Large-scale, standardized prevalence and KAP studies across diverse Nigerian tertiary hospitals.
- Intervention effectiveness research evaluating different IPC strategies (training modalities, bundles, behavioural interventions) in the Nigerian context.
- Studies on the impact of organizational factors (leadership, safety culture, staffing) on IPC implementation.
- Implementation science research to understand barriers/facilitators to sustaining effective interventions.
- Detailed economic evaluations of IPC programs in Nigeria.

In conclusion, significant improvements in HAI prevention within Nigerian tertiary hospitals hinge on addressing the deeply rooted systemic barriers that currently prevent HCWs from consistently applying their knowledge and positive attitudes. A comprehensive, resourced, and sustained effort involving all stakeholders is necessary.

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