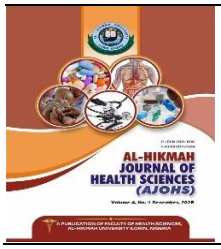
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Original Article

Knowledge and Compliance Regarding Infection Prevention and Control Guidelines Among Primary Health Care Providers in Ilorin Metropolis, Kwara State

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ABSTRACT

Background: Infection prevention and control (IPC) minimizes healthcare-associated infections, yet primary health care (PHC) providers in resource-constrained settings frequently exhibit suboptimal adherence.

Objective: To assess IPC knowledge and determine the extent of compliance with key IPC practices among primary health care providers in Ilorin Metropolis.

Methods: A descriptive cross-sectional design utilized structured questionnaires (n=405), observational checklists (120 care episodes), and key informant interviews (n=12) to collect data across randomly selected PHC facilities. Data were analyzed using SPSS Version 27 for quantitative analysis, while qualitative data was analyzed thematically.

Results: Most respondents demonstrated moderate (51.6%) or good (36.8%) overall knowledge. Self-reported compliance indicated good adherence in 60.7% of respondents, with high scores in safe injection practices (Mean = 4.43); however, direct observations revealed lower actual adherence in routine hand hygiene after touching patient surroundings (35.0%) and waste segregation (41.7%). Both knowledge ($X^2 = 68.42$, $p < 0.05$) and resource availability ($X^2 = 41.36$, $p < 0.05$) were significantly associated with compliance.

Conclusion: While PHC providers possess satisfactory basic knowledge and positive attitudes, a distinct gap remains between theoretical understanding and actual clinical execution, driven by supply shortages and heavy workloads. Bridging this gap requires regular refresher training paired with uninterrupted institutional resource provisioning.

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Introduction

Infection prevention and control (IPC) constitutes a critical component of healthcare delivery aimed at minimizing the risk of healthcare-associated infections (HAIs) among patients and healthcare workers. Effective IPC practices encompass a range of measures, including hand hygiene, the use of personal protective equipment (PPE), safe injection practices, and proper waste management, all of which are essential in reducing the transmission of pathogens (World Health Organization, 2021). In low- and middle-income countries like Nigeria, where resources may be limited, robust IPC implementation becomes even more vital to curb the burden of HAIs

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and antimicrobial resistance. Primary health care (PHC) facilities serve as the first point of contact for most individuals seeking healthcare, making compliance with IPC guidelines in these settings fundamental to community health outcomes (Okikiola & Saka, 2024).

Globally, HAIs affect millions of patients annually, contributing significantly to morbidity, mortality, and increased healthcare costs. Studies indicate that a substantial proportion of these infections are preventable through adherence to standard IPC protocols. The emergence and re-emergence of infectious diseases, including outbreaks like Ebola and COVID-19, have further highlighted the gaps in IPC preparedness, particularly in resource-constrained environments. Healthcare workers in developing countries face heightened infection risks due to suboptimal IPC practices (Olalekan et al., 2025). Primary healthcare providers, who often operate with minimal infrastructure, play a pivotal role in early detection and containment of infections, making the assessment of compliance levels necessary to identify barriers and strengthen health systems (Ochie et al., 2022).

In Nigeria, primary healthcare remains the cornerstone of the national health system, providing essential services to a large segment of the population, especially in urban and semi-urban areas like Ilorin Metropolis in Kwara State. However, challenges such as inadequate infrastructure, limited supplies of PPE, and insufficient training often hinder optimal IPC adherence among PHC providers. Research in various Nigerian states has revealed varying levels of IPC knowledge and practice, with many studies reporting suboptimal compliance despite awareness of basic measures (Ochie et al., 2022; Okikiola & Saka, 2024). Factors including heavy workloads, lack of administrative support, and poor policy enforcement contribute to these persistent gaps.

Addressing IPC in settings like Ilorin is crucial given the region's population density and role as a commercial and transit hub in North-Central Nigeria. The absence of comprehensive, up-to-date data on IPC compliance specifically among PHC providers in Ilorin Metropolis hinders effective policy formulation and intervention planning. This study was therefore designed to assess the level of knowledge of infection prevention and control measures among primary health care providers and to determine the extent of compliance with key IPC practices within Ilorin Metropolis.

Materials and Methods

Study Design and Area

This study adopted a descriptive cross-sectional design utilizing a quantitative and qualitative approach to assess compliance with IPC guidelines among primary healthcare providers in Ilorin Metropolis, Kwara State. The research was conducted within Ilorin Metropolis, Kwara Central, which comprises three Local Government Areas (LGAs): Ilorin West, Ilorin East, and Ilorin South.

Study Population and Sampling Technique

The target population comprised frontline primary healthcare providers—specifically Nurses, Community Health Officers (CHOs), and Community Health Extension Workers (CHEWs) who maintain direct patient contact. The sample size was calculated using Cochran's formula for large populations yielding a final targeted sample size of 422 healthcare providers. A multi-stage sampling procedure was implemented. After stratifying the area into the three LGAs, a 40% sampling fraction was applied to select 20 PHC facilities. Bowley's proportional allocation formula was then used to distribute the questionnaires across the LGAs.

Instruments for Data Collection

Data were gathered using structured, self-administered questionnaires. To triangulate the quantitative self-reports, a structured observational checklist (adapted from WHO/NCDC guidelines) was used to discreetly assess actual IPC practices. Specifically, 15 primary health care facilities were selected across the 3 LGAs, and eight care episodes were observed in each facility, yielding a total of 120 observations. Additionally, Key Informant Interviews (KII) were conducted with 12 Officers-in-Charge and IPC focal persons to explore institutional constraints. Content validity was established through expert review, and reliability was tested via a pilot study yielding acceptable internal consistency (Cronbach's alpha geq 0.70).

Data Analysis

Completed forms were processed using SPSS Version 27. Analyses included descriptive statistics and inferential Chi-square tests at a 0.05 significance level. Qualitative responses from the KIIs were analyzed thematically.

Results

Out of 422 administered questionnaires, 405 were validly completed and retrieved, representing a 96.0% response rate. Most respondents were aged 30–39 years (39.0%) and female (72.3%). By designation, nurses formed the largest group (45.2%), followed by CHEWs (27.2%) and CHOs (24.7%). Over half held a Diploma (52.3%), and 79.0% reported prior IPC training within the preceding three years.

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Table 1: Knowledge of Infection Prevention and Control among Primary Health Care Providers

S/N	Statement	True F (%)	False F (%)	I Don't Know F (%)
1	A new sterile needle and syringe must be used for every injection	372 (91.9)	20 (4.9)	13 (3.2)
2	Hand hygiene should be performed before and after every patient contact	360 (88.9)	28 (6.9)	17 (4.2)
3	Sharps should be disposed of in puncture-proof safety boxes	355 (87.7)	32 (7.9)	18 (4.4)
4	Environmental surfaces should be cleaned and disinfected between patients	340 (84.0)	40 (9.9)	25 (6.2)
5	Masks should be worn when there is risk of splashes or airborne transmission	335 (82.7)	47 (11.6)	23 (5.7)
6	Healthcare waste should be segregated at the point of generation	330 (81.5)	45 (11.1)	30 (7.4)
7	Standard precautions apply to all patients at all times	295 (72.8)	75 (18.5)	35 (8.6)

Table 1 highlights that respondents demonstrated good knowledge of basic IPC measures, such as using sterile needles for every injection (91.9%) and performing hand hygiene before and after patient contact (88.9%). Overall, 51.6% of respondents possessed a moderate level of knowledge, 36.8% had good knowledge, and 11.6% had poor knowledge.

Table 2: Self-reported Compliance (Practice) with IPC Guidelines

S/N	Statement	Always F (%)	Often F (%)	Sometimes F (%)	Rarely F (%)	Never F (%)	Mean	SD
1	I use a new sterile syringe and needle for each patient	240 (59.3)	120 (29.6)	30 (7.4)	10 (2.5)	5 (1.2)	4.43	0.83
2	I dispose of sharps immediately into safety box	200 (49.4)	140 (34.6)	45 (11.1)	12 (3.0)	8 (2.0)	4.26	0.91
3	I perform hand hygiene after removing gloves	165 (40.7)	150 (37.0)	60 (14.8)	20 (4.9)	10 (2.5)	4.09	0.98
4	I wear a mask when there is risk of respiratory infection transmission	145 (35.8)	160 (39.5)	70 (17.3)	20 (4.9)	10 (2.5)	4.01	0.97
5	I segregate healthcare waste into colour-coded bins	95 (23.5)	140 (34.6)	110 (27.2)	40 (9.9)	20 (4.9)	3.62	1.10
6	I perform hand hygiene after touching patient surroundings	80 (19.8)	130 (32.1)	120 (29.6)	55 (13.6)	20 (4.9)	3.48	1.10

Self-reported practices indicated good overall compliance in 60.7% of respondents, moderate compliance in 29.6%, and poor compliance in 9.6%.

Table 3: Observed IPC Practices among Primary Health Care Providers – Direct Observation (N=120)

Area	Specific Practice	Yes F (%)	No F (%)	N/A F (%)
Hand Hygiene	Hand hygiene before patient contact	60 (50.0)	54 (45.0)	6 (5.0)
Hand Hygiene	Hand hygiene after touching patient surroundings	42 (35.0)	66 (55.0)	12 (10.0)
PPE Utilisation	Correct donning and doffing observed	54 (45.0)	58 (48.3)	8 (6.7)
Safe Injection	Sharps disposed immediately into safety box	82 (68.3)	30 (25.0)	8 (6.7)
Waste Mgt.	Waste segregated at point of generation	50 (41.7)	62 (51.7)	8 (6.7)
Resources	Colour-coded waste bins available and used	46 (38.3)	66 (55.0)	8 (6.7)

Observation of 120 care episodes revealed that actual compliance was generally lower than self-reported compliance. While safe injection practices were well-adhered to, major gaps were visible in hand hygiene after touching patient surroundings (35.0%) and waste segregation at point of generation (41.7%).

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Table 4: Themes Emerging from Key Informant Interviews (N=12)

Theme	Summary of Informant Views	Informants Raising Theme
Resource constraints	Inconsistent supply of PPE, hand rub, sharps boxes and waste bins was the most frequently described obstacle.	10
Weak IPC structures	Facilities without a functional IPC committee relied on ad hoc, individually-driven compliance efforts.	8
Heavy workload	High patient volume was repeatedly described as forcing providers to prioritise speed over strict protocol adherence.	9

Qualitative findings confirmed that inadequate resources, heavy workload, and weak institutional IPC structures act as severe operational constraints.

Table 5: Chi-square Test of the Relationship between Knowledge of IPC and Compliance

Knowledge Level	Good Compliance n (%)	Moderate Compliance n (%)	Poor Compliance n (%)	Total	χ^2	df	p-value	Decision
Good	98 (65.8)	42 (28.2)	9 (6.0)	149				
Moderate	118 (56.5)	72 (34.4)	19 (9.1)	209	68.42	4	0.000	Reject H_0
Poor	30 (63.8)	6 (12.8)	11 (23.4)	47				
Total	246	120	39	405				

As detailed in Table 5, there was a statistically significant relationship between knowledge and compliance ($X^2 = 68.42$, $p < 0.05$). Notably, a high proportion (63.8%) of respondents with poor knowledge self-reported good compliance. This statistical anomaly may be attributed to social desirability bias or a fundamental misunderstanding of standard IPC protocols, leading these individuals to overestimate their actual clinical adherence.

Table 6: Chi-square Test of the Influence of IPC Resource Availability on Compliance

Resource Availability	Good Compliance n (%)	Moderate Compliance n (%)	Poor Compliance n (%)	Total	χ^2	df	p-value	Decision
High Availability	138 (68.0)	48 (23.6)	17 (8.4)	203				
Low Availability	108 (53.5)	72 (35.6)	22 (10.9)	202	41.36	2	0.000	Reject H_0
Total	246	120	39	405				

Table 6 demonstrates that the availability of IPC resources significantly influences compliance ($X^2 = 41.36$, $p < 0.05$).

Discussion

The socio-demographic profile of respondents characterized by a predominance of female healthcare providers, particularly nurses and community health workers, reflects the standard staffing structure of primary healthcare facilities in urban Nigerian settings. The finding that the majority of respondents possessed moderate (51.6%) to good (36.8%) overall knowledge of IPC measures aligns with previous assessments across Nigeria (Ochie et al., 2022; Okikiola & Saka, 2024). Respondents demonstrated sound awareness of foundational practices, such as utilizing new sterile syringes for every injection (91.9%). However, notable knowledge gaps persisted in technical procedures. These deficits underscore the argument by the World Health Organization (2016) that baseline professional training must be continuously reinforced.

In evaluating practice outcomes, self-reported metrics indicated good overall compliance among 60.7% of respondents, with safe injection practices scoring highest. Crucially, however, direct observations via structured checklists revealed that actual clinical compliance was frequently lower than self-reported measures a discrepancy heavily influenced by social desirability bias inherent in questionnaire-based evaluations (World Health Organization, 2009). Observed adherence dropped notably during hand hygiene tasks following contact with patient surroundings (35.0%) and waste segregation at point of generation (41.7%), matching observations by Edward et al., (2024) regarding operational inconsistencies in low-resource facilities.

The inferential analyses yielded statistically significant positive relationships between both knowledge and compliance ($X^2=68.42$, $p<0.05$) as well as resource availability and compliance

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(X^2=41.36, p<0.05). Key informants and quantitative barrier metrics highlighted that lack of supplies (65.4%) and excessive workloads (56.8%) served as primary impediments preventing health workers from translating theoretical awareness into consistent daily execution. Consequently, ensuring sustained IPC adherence in Ilorin Metropolis requires rectifying individual knowledge gaps through continuous education while concurrently resolving structural supply chain deficiencies.

Conclusion

Primary healthcare providers in Ilorin Metropolis exhibit moderate to good knowledge and favorable attitudes toward infection prevention and control (IPC), yet these cognitive enablers do not consistently translate into optimal clinical practice. Significant gaps remain between self-reported compliance and actual observed behaviors particularly regarding hand hygiene and waste segregation largely driven by persistent institutional barriers such as supply shortages, heavy workloads, and inadequate continuous training. Bridging this operational gap requires a multi-faceted approach centered on strengthening facility-level resource allocation, establishing functional IPC committees, and instituting routine, competency-based refresher training to safeguard both patient and healthcare worker safety.

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