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Research Article:

# Perceived Effectiveness of Hand Practice in Reducing Hospital Acquired Infections among Health Professionals in Abia State Specialist Hospital, Umuahia, Nigeria

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**ABSTRACT:**
Hospital-acquired infections (HAIs) remain a major public health challenge in low- and middle-income countries, including Nigeria, where suboptimal hand hygiene (HH) practices among health professionals contribute significantly to transmission. This descriptive cross-sectional study assessed the level of knowledge of health professionals regarding hand hygiene practices and their role in preventing HAIs, evaluated their perceived effectiveness of HH in reducing HAIs, and identified factors influencing compliance at Abia State Specialist Hospital, Umuahia. A total of 212 health professionals were selected through multistage sampling (stratified and convenience) from a target population of 450. Data were collected using a self-administered, structured, close-ended questionnaire divided into four sections: socio-demographics and three Likert-scale domains (4-point scale: Strongly Agree to Strongly Disagree). Analysis was performed using frequencies, percentages, and mean scores (High ⩾3.0, Moderate 2.50 – 2.99, Low <2.50).Results revealed a high level of knowledge (overall mean = 3.15 ± 0.72), with strong awareness of the role of hands in germ transmission and HH benefits for patients and workers. Perceived effectiveness was also high (overall mean = 3.19 ± 0.78), as most respondents viewed HH as highly effective in reducing HAIs and improving patient safety. However, compliance was strongly influenced by barriers such as lack of water and soap (mean = 3.22), high workload (mean = 3.17), and unavailability of alcohol-based hand rub at point of care (mean = 3.15). Training and reminders emerged as key facilitators.These findings indicate a favourable knowledge-perception profile but persistent infrastructural and systemic barriers, consistent with patterns in other Nigerian tertiary hospitals. The study recommends urgent implementation of the WHO Multimodal Hand Hygiene Improvement Strategy, including reliable supplies, practical training, monitoring, and leadership commitment to bridge the knowledge-practice gap and reduce HAIs in the facility.

**Keyword:** Hand Hygiene, Hospital-Acquired Infections, Perceived Effectiveness, Compliance

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## INTRODUCTION

Hospital-acquired infections (HAIs), also known as nosocomial or healthcare-associated infections, remain a major public health challenge worldwide, particularly in low- and middle-income countries. These infections are acquired by patients during their stay in healthcare facilities and are not present or incubating at the time of admission. Common HAIs include surgical site infections, catheter-associated urinary tract infections, ventilator-associated pneumonia, and bloodstream infections. In Nigeria, the pooled prevalence of HAIs has been estimated at 15.75%, with urinary tract infections, surgical site infections, and skin/soft tissue infections being the most common. A point-prevalence survey in Northern Nigeria reported a rate of 14.3%, with higher rates in neonatal and pediatric surgical units. In sub-Saharan Africa, the overall prevalence stands at approximately 12.9%, with West Africa (including Nigeria) showing around 15.5%. These infections lead to prolonged hospital stays, increased healthcare costs,

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higher morbidity and mortality, and significant strain on already overstretched healthcare systems [1-2]. Hand hygiene is widely recognized as the single most effective and cost-efficient measure in preventing the transmission of infectious agents in healthcare settings. The World Health Organization (WHO) consistently emphasizes that proper hand hygiene practices among health professionals—such as washing hands with soap and water or using alcohol-based hand rubs at the five critical moments—can substantially reduce HAIs. However, compliance rates among healthcare workers in many Nigerian hospitals remain low, often below 40%. Factors contributing to poor compliance include high workload, inadequate infrastructure, limited access to running water and hand hygiene supplies, and inconsistent adherence to infection prevention and control (IPC) protocols [4-5].

In tertiary hospitals like Abia State Specialist Hospital in Umuahia, Abia State, Southeast Nigeria, the high patient volume and referral role increase the risk of HAIs. Despite existing infection control policies, suboptimal hand hygiene practices persist among health professionals due to workload pressure, forgetfulness, skin irritation, inadequate training, and irregular supply of alcohol-based hand sanitizers [6]. Understanding the perceived effectivenessof hand hygiene practices from the perspective of health professionals is crucial because perception strongly influences behavior and compliance [7]. When healthcare workers perceive hand hygiene as highly effective in reducing HAIs, compliance tends to improve. This study therefore examines the perceived effectiveness of hand-hygiene practices in reducing hospital-acquired infections among health professionals in Abia State Specialist Hospital, Abia State. The findings will provide insights for strengthening IPC measures in the facility and similar settings in Nigeria.

## METHODOLOGY

### Research Design

The study adopted a descriptive cross-sectional survey design. This design is suitable for collecting data at a single point in time to describe the knowledge levels, perceived effectiveness, compliance, and influencing factors related to hand hygiene practices among health professionals. It supports the use of a structured questionnaire to obtain quantitative information on attitudes, self-reported behaviours, and relationships between variables without any manipulation of the study variables. The cross-sectional survey design aligns directly with the study objectives by enabling efficient assessment of opinions and practices in a real-world hospital environment.

### Research Setting

The study was conducted at Abia State Specialist Hospital and Diagnostic Centre, Umuahia, Abia State, Nigeria. The hospital is a tertiary public health institution located in Umuahia, the capital of Abia State in the South-East geopolitical zone of Nigeria. It serves as a major referral centre for Abia State and surrounding regions, offering specialist care in departments such as internal medicine, surgery, paediatrics, obstetrics and gynaecology, emergency services, intensive care, laboratory services, and pharmacy. The facility is equipped with modern diagnostic tools and manages a high volume of in-patients and out-patients, creating an appropriate environment for investigating hand hygiene practices and their role in preventing hospital-acquired infections (HAIs) among health professionals.

### Target Population

The target population for this study comprised all 450 health professionals directly involved in patient care at Abia State Specialist Hospital, Umuahia. This included medical doctors, nurses, midwives, pharmacists, medical laboratory scientists, and other allied health workers. The population figure of 450 was obtained from the official records of the hospital's Human Resources Department at the time of the study. This population was selected because these professionals have direct and frequent contact with patients and are primarily responsible for implementing hand hygiene protocols that are essential for the prevention and control of HAIs in the clinical setting.

### Sampling Size Determination

The sample size for the study was determined using Taro Yamane's (1967) formula for a finite population. This formula is appropriate for descriptive survey research where the population size is known, as it provides a statistically representative sample with a specified margin of error.

Taro Yamane formula is $n = \frac{N}{1+N(e)^2}$

Where
n = Sample size
N = Population size (450)
e = margin of error (0.05)
I = standard

$n = \frac{450}{1+450(0.05)^2}$

$n = \frac{450}{1+450(0.0025)}$

$n = \frac{450}{2.125}$

$n = 211.76 \cong 212$

$n = 212$

The calculated sample size was rounded upward to 212 to ensure adequacy. This sample size was adequate to provide reliable estimates for the study.

**Sampling Technique**

A multistage sampling technique involving stratified and convenience sampling was employed in selecting respondents. Stratified sampling was initially applied to classify the health professionals into categories: doctors, nurses, midwives, laboratory scientists and other allied health professionals to ensure the proportionate representation of each group. Within these strata, convenience sampling was used. Eligible health professionals who were on duty and willing to participate during the data collection period were conveniently selected until the allocated quota for the stratum was reached. This approach was practical given the shift duties and busy clinical schedules.

- **Inclusion criteria**: Registered health professionals (doctors, nurses, and allied cadres) involved in patient care who had worked in the hospital for at least six months and provided informed consent.
- **Exclusion criteria**: Administrative staff not involved in clinical care, students on temporary postings, and those who declined consent.

**Instruments for Data Collection**

A self-administered, structured, close-ended questionnaire was used for data collection. The questionnaire consisted of four sections:

**Section A**: Socio-demographic Information of the Respondents.

**Section B**: Knowledge of Hand Hygiene and HAIs.

**Section C**: Perceived Effectiveness of Hand Hygiene.

**Section D**: Factors Influencing Hand Hygiene Compliance.

Total Likert-scale items (Sections B, C, D): 18. The questionnaire was adapted from WHO Hand Hygiene Knowledge tools and similar Nigerian studies. It was pre-tested on 20 health professionals in a similar but non-participating facility (Federal Medical Centre), for clarity and appropriateness.

**Validity of Instrument**

The questionnaire was constructed and submitted to the supervisor for correction. The researcher made effects on the corrections before it was typed and distributed to the respondents for data collection.

**Reliability of Instrument**

The reliability of the instrument was determined through a pilot study conducted with 20 health professionals from Federal Medical Centre. The test-retest method was used, with the questionnaire administered twice at an interval of two weeks. The Pearson correlation coefficient obtained was 0.85.

**Method of Data Collection**

Permission was first obtained from the hospital management. Face to face method of administration was adopted by the researcher in distributing the questionnaires to the selected participants during convenient times (such as duty shifts or break periods) to avoid disruption of clinical services. The respondents were given about twenty minutes to complete their questionnaire. Completed questionnaires were retrieved immediately or shortly after completion to ensure a high response rate. Data collection was completed over a period of three weeks. A total of 220 questionnaires were distributed; 212 were correctly completed and returned, giving a response rate of 96.4%.

**Method of Data Analysis**

Data collected was analysed using descriptive statistics such as frequencies, means and percentages. These statistical tools were used to summarise the response and present findings in relation to the demographic information and research questions. Mean scores were calculated for each section and interpreted as: High (≥ 3.0), Moderate (2.50 – 2.99), and Low (< 2.50). Responses were categorised into "Agree" (Strongly Agree + Agree) and "Disagree" (Strongly Disagree + Disagree) and presented in frequency tables.

**Ethical Consideration**

Ethical approval was obtained from the Health Research Ethics Committee of Abia State Specialist Hospital. Administrative permission was also secured from the hospital management. The respondents were fully informed about the purpose of the study, and their consent was gained. The respondents were also assured that information given will be held in confidence and ensured that they were protected from physical and mental harm. The respondents were also informed of

their right to withdraw from the study at any time without any negative consequences.

**RESULTS**

A total of 212 questionnaires were correctly completed and returned out of 220 distributed, giving a response rate of 96.4%. The results are presented below in tables according to the objectives of the study.

**Table 1. Socio-demographic Characteristics of Respondents (n=212)**

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| **Age** | 20-29 years | 68 | 32.1 |
| | 30-39 years | 89 | 42.0 |
| | 40-49 years | 39 | 18.4 |
| | 50+ years | 16 | 7.5 |
| **Sex** | Male | 78 | 36.8 |
| | Female | 134 | 63.2 |
| **Professional Cadre** | Doctor | 52 | 24.5 |
| | Nurse | 98 | 46.2 |
| | Pharmacist | 18 | 8.5 |
| | Lab Scientist/Technician | 29 | 13.7 |
| | Others | 15 | 7.1 |
| **Years of Experience** | <5 years | 72 | 34.0 |
| | 5-9 years | 65 | 30.7 |
| | 10-14 years | 48 | 22.6 |
| | 15+ years | 27 | 12.7 |
| **Department/Unit** | Medical | 58 | 27.4 |
| | Surgical/Theatre | 49 | 23.1 |
| | O&G/Maternity | 42 | 19.8 |
| | Paediatrics/Neonatal | 37 | 17.5 |
| | Lab/Pharmacy/ICU | 26 | 12.3 |
| **Formal HH Training** | Yes | 124 | 58.5 |
| | No | 88 | 41.5 |

**Table 1**: The majority of respondents (42.0%) were in the 30-39 years age group, followed by 32.1% in 20-29 years. Females constituted 63.2% of the sample. Nurses formed the largest professional cadre (46.2%), while doctors accounted for 24.5%. Over 64% had less than 10 years of working experience. The medical department had the highest representation (27.4%). Slightly more than half (58.5%) had received formal training on hand hygiene. This distribution reflects the typical staffing pattern in a Nigerian tertiary hospital, with a predominance of younger female nurses.

**Table 2. Respondents' Knowledge of Hand Hygiene and HAIs (n=212)**

| S/N | Item | Options | Frequency (n) | Percentage (%) |
|---|---|---|---|---|
| 1 | I know the WHO Five Moments for Hand Hygiene | SA | 89 | |
| | | A | 78 | 2.0 |
| | | D | 32 | 36.8 |
| | | SD | 13 | 15.1 |
| | | Mean | 3.15 ± 0.92 | 6.1 |
| | | Interpretation | High | |
| 2 | Hands are the main route of germ transmission | SA | 112 | 52.8 |
| | | A | 71 | 33.5 |
| | | D | 19 | 9.0 |
| | | SD | 10 | 4.7 |
| | | Mean | 3.34 ± 0.85 | |
| | | Interpretation | High | |
| 3 | Hand hygiene prevents transmission to patients | SA | 98 | 46.2 |
| | | A | 82 | 38.7 |
| | | D | 24 | 11.3 |
| | | SD | 8 | 3.8 |

| | | | | |
|---|---|---|---|---|
| | | Mean<br>Interpretation | 3.27 ± 0.88<br>High | |
| 4 | Hand hygiene prevents transmission to health workers | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 95<br>79<br>28<br>10<br>3.22 ± 0.91<br>High | 44.8<br>37.3<br>13.2<br>4.7 |
| 5 | Alcohol hand rub is effective against most germs | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 76<br>85<br>39<br>12<br>3.06 ± 0.95<br>High | 35.8<br>40.1<br>18.4<br>5.7 |
| 6 | I know when to wash hands versus use hand rub | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 68<br>72<br>51<br>21<br>2.88 ± 1.02<br>Moderate | 32.1<br>34.0<br>24.1<br>9.9 |
| | | Overall<br>Mean Score<br>Interpretation | 3.15 ± 0.72<br>**High** | |

**(4-point Likert: SA=4, A=3, D=2, SD=1; Mean score interpretation: High ≥3.0, Moderate 2.50-2.99, Low <2.50)**

**Table 2**: The overall mean knowledge score was 3.15 ± 0.72, indicating a high level of knowledge. Respondents demonstrated strong awareness that hands are the main route of germ transmission (mean 3.34) and that hand hygiene prevents transmission to both patients and health workers. However, knowledge was relatively lower on distinguishing when to wash hands versus using alcohol-based hand rub (mean 2.88, moderate). Over 78% agreed or strongly agreed with most items. This finding aligns with several Nigerian studies where knowledge is generally moderate to high, yet gaps exist in specific technical aspects.

**Table 3. Perceived Effectiveness of Hand Hygiene in Reducing HAIs (n=212)**

| S/N | Item | Options | Frequency (n) | Percentage (%) |
|---|---|---|---|---|
| 1 | Hand hygiene greatly reduces HAIs in this hospital | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 92<br>81<br>29<br>10<br>3.20 ± 0.90<br>High | 43.4<br>38.2<br>13.7<br>4.7 |
| 2 | Alcohol-based hand rub is highly effective | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 85<br>79<br>35<br>13<br>3.11 ± 0.94<br>High | 40.1<br>37.3<br>16.5<br>6.1 |
| 3 | Proper hand hygiene improves patient safety | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 104<br>76<br>23<br>9<br>3.30 ± 0.87<br>High | 49.1<br>35.8<br>10.8<br>4.2 |
| 4 | Hand hygiene lowers infection risk during patient care | SA<br>A<br>D<br>SD | 97<br>83<br>21<br>11 | 45.8<br>39.2<br>9.9<br>5.2 |

| | | | | |
|---|---|---|---|---|
| | | Mean<br>Interpretation | 3.25 ± 0.89<br>High | |
| 5 | Consistent hand hygiene prevents outbreaks | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 71<br>88<br>39<br>14<br>3.02 ± 0.96<br>High | <br>33.5<br>41.5<br>18.4<br>6.6 |
| 6 | Hand hygiene is one of the best ways to fight HAIs | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 99<br>77<br>26<br>10<br>3.25 ± 0.90<br>High | <br>46.7<br>36.3<br>12.3<br>4.7 |
| | | Overall Mean Score<br>Interpretation | 3.19 ± 0.78<br>**High** | |

**Table 3**: The overall mean score for perceived effectiveness was 3.19 ± 0.78, indicating high perceived effectiveness. Nearly 80-85% of respondents agreed or strongly agreed that hand hygiene greatly reduces HAIs, improves patient safety, and is one of the best preventive measures. The highest agreement was on its role in improving patient safety (mean 3.30). This positive perception exists despite known infrastructural challenges in similar Nigerian settings and suggests strong belief in the benefits of hand hygiene, consistent with the Health Belief Model's "perceived benefits"

**Table 4. Factors Influencing Hand Hygiene Compliance (n=212)**

| S/N | Item | Options | Frequency (n) | Percentage (%) |
|---|---|---|---|---|
| 1 | Lack of water and soap hinders my compliance | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 98<br>76<br>25<br>13<br>3.22 ± 0.93<br>High (barrier) | <br>46.2<br>35.8<br>11.8<br>6.1 |
| 2 | High workload reduces my hand hygiene practice | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 89<br>82<br>28<br>13<br>3.17 ± 0.92<br>High (barrier) | <br>42.0<br>38.7<br>13.2<br>6.1 |
| 3 | No hand rub at point of care is a major barrier | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 94<br>71<br>32<br>15<br>3.15 ± 0.97<br>High (barrier) | <br>44.3<br>33.5<br>15.1<br>7.1 |
| 4 | Skin irritation discourages frequent hand hygiene | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 62<br>68<br>59<br>23<br>2.80 ± 1.01<br>Moderate | 29.2<br>32.1<br>27.8<br>10.8 |
| 5 | Posters and reminders encourage compliance | SA<br>A<br>D<br>SD<br>Mean | 78<br>85<br>33<br>16<br>3.06 ± 0.95 | 36.8<br>40.1<br>15.6<br>7.5 |

| | | | | |
|---|---|---|---|---|
| | | Interpretation | High (facilitator) | |
| 6 | Training improves my hand hygiene adherence | SA<br>A<br>D<br>SD<br>Mean<br>Interpretation | 91<br>79<br>29<br>13<br>3.17 ± 0.91<br>High (facilitator) | <br>42.9<br>37.3<br>13.7<br>6.1 |
| | | Overall Mean Score<br>Interpretation | 3.10 ± 0.81<br>High influence of factors | |

Table 4: The overall mean score was 3.10 ± 0.81, showing that several factors strongly influence compliance. Major barriers with high mean scores included lack of water and soap (3.22), high workload (3.17), and unavailability of hand rub at the point of care (3.15). Facilitators such as training (3.17) and posters/reminders (3.06) were also highly rated. Skin irritation had a moderate influence. These findings reveal that while perceptions and knowledge are high, infrastructural and workload-related barriers remain dominant, consistent with reports from other Nigerian tertiary hospitals where compliance is often suboptimal despite awareness.

## DISCUSSION

The present study assessed the level of knowledge of health professionals regarding hand hygiene (HH) practices and their role in preventing hospital-acquired infections (HAIs), the perceived effectiveness of HH practices in reducing HAIs, and the factors influencing compliance with recommended HH practices among health professionals at Abia State Specialist Hospital, Umuahia. The findings revealed a high level of knowledge (overall mean score 3.15 ± 0.72), high perceived effectiveness (overall mean 3.19 ± 0.78), yet significant infrastructural and workload-related barriers to compliance (overall mean influence of factors 3.10 ± 0.81). These results are discussed below in relation to the three research objectives and compared with existing literature. On the first objective, respondents demonstrated a high level of knowledge of HH practices and the role of HH in HAI prevention. Strong awareness was recorded on the transmission role of hands and the preventive benefits for patients and health workers. However, a relatively moderate score was observed on knowing when to use soap and water versus alcohol-based hand rub (ABHR). This pattern of generally high knowledge with specific technical gaps mirrors findings from several Nigerian tertiary hospitals. For instance, studies in southwest and southeast Nigeria reported good overall knowledge but lower proficiency in distinguishing HH moments or techniques. In a South-East Nigerian tertiary hospital (including Umuahia context), compliance with the WHO Five Moments was low despite awareness, with particular weakness before aseptic procedures. Similarly, in southwest Nigeria, while 98.95% had good knowledge, self-reported practice before and after patient contact remained moderate [8].

The high knowledge level in this study may be attributed to the fact that over 58% of respondents had received formal HH training and the predominance of nurses (46.2%), who often receive more IPC exposure. This aligns with the Health Belief Model (HBM), where knowledge serves as a modifying factor that can enhance perceived susceptibility and severity of HAIs when reinforced by training. However, the gap in technical specifics (e.g., wash vs. rub) underscores the need for practical, hands-on refresher training rather than theoretical sessions alone, consistent with WHO recommendations for multimodal strategies. Regarding the second objective, health professionals exhibited high perceived effectiveness of HH in reducing HAIs. A large proportion strongly agreed that proper HH greatly reduces HAIs, improves patient safety, lowers infection risk, and is one of the best preventive measures. The highest rating was on its contribution to patient safety. This positive perception reflects strong belief in the benefits of HH, a core construct of the HBM (perceived benefits). Such optimistic views are encouraging and consistent with reports from other Nigerian settings where healthcare workers recognise HH as highly effective against HAIs and antimicrobial resistance, even when actual compliance lags [9].

For the third objective, the study identified key factors influencing compliance, with infrastructural deficits and workload emerging as dominant barriers. Lack of water and soap (mean 3.22), high workload (mean 3.17), and unavailability of ABHR at the point of care (mean 3.15) were rated highly as hindrances. Facilitators such as

training (mean 3.17) and posters/reminders (mean 3.06) were also acknowledged. Skin irritation had only moderate influence. These barriers are widely documented in Nigerian and sub-Saharan African literature. Studies in southwest, northwest, and north-central Nigeria consistently highlight lack of running water, soap, ABHR, and functional sinks as major constraints, alongside heavy workload and time pressure. In a South-East Nigerian tertiary hospital, overall HH compliance was only 23.5%, with lowest adherence before aseptic procedures. In southwest Nigeria, lack of running water (53.4%) and ABHR unavailability (26.6%) were cited as primary reasons for inconsistent practice despite good knowledge and attitude. A 2025 Port Harcourt ICU study similarly reported 98.5% non-compliance before patient care, mainly due to no running water (81.8%) and absence of posters/soap [10].

## CONCLUSION

Health professionals at Abia State Specialist Hospital, Umuahia, possess high knowledge of hand hygiene practices and their role in preventing HAIs, coupled with strong perception of its effectiveness in reducing infections. However, compliance is likely compromised by lack of essential supplies and high workload. Addressing these systemic barriers through multimodal interventions is essential to translate positive knowledge and perceptions into consistent practice, thereby reducing the burden of hospital-acquired infections in the facility.

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