

Original Research Article

Knowledge and Practice of Hand Hygiene Among Students of Bayelsa State College of Health Technology, Otuogidi, Ogbia Town, Nigeria

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Abstract: Hand hygiene remains the single, cheapest and most practical public health measure for preventing transmission of microorganisms and healthcare-associated infections. Despite its simplicity, compliance is poor among healthcare providers and students. The objective is to assess the knowledge and practice of hand hygiene among students of Bayelsa State College of Health Technology (BYCOHTECH). The methodology is a cross-sectional study was conducted among students of BYCOHTECH. A sample size of 285 was determined using Taro Yamane's formula from a population of 986. A structured questionnaire assessed demographics, knowledge of food/hand hygiene, food handling, and personal hygiene practices. Data were analyzed using SPSS version 21 with descriptive statistics. The respondents were mostly female (100%), aged 15–24 years (36.8%), married (57.9%), with secondary education (73.7%). Knowledge of hand hygiene was high: respondents strongly agreed that washing hands prevents contamination (Mean = 1.26), food hygiene means keeping food clean and safe (Mean = 1.47), and dirty utensils transmit disease (Mean = 1.95). For practices: 42.1% always wash hands before preparing food, 57.9% always use clean water for cooking, 89.5% always reheat leftover food, and 68.4% always separate raw from cooked food. However, only 42.1% always wash their hands after using the toilet, 26.3% always wear clean aprons, 31.6% always cover their hair while preparing food, and 57.9% never undergo regular medical check-ups. The conclusion demonstrated students' high theoretical knowledge of hand hygiene but inconsistencies in practice, especially in personal hygiene, like apron use, hair covering, and medical check-ups. It is therefore recommended that continuous practical demonstrations, provision of handwashing facilities, institutional policies, and behavioral reinforcement are needed to bridge the knowledge-practice gap.

Keywords: Hand hygiene, Knowledge, Practice, Students

Introduction

Background to the Study

Globally, hand hygiene remains the single, cheapest and most practical public health measure associated with the prevention of transmission of microorganisms and healthcare infectious diseases, while drastically reducing the spread of antimicrobial resistance. In spite of the simplicity of this procedure, compliance has been poor among healthcare providers and medical students. According to the World Health Organization, washing hands with soap and water could reduce diarrhea-related deaths by half.

The World Health Organization introduced the 'five moments for hand hygiene' programme to help improve compliance: before touching a patient, before performing aseptic procedures, after exposure to body fluids, after touching a patient, and after touching patient surroundings. This approach has significantly improved understanding and practice among healthcare practitioners.

Hand hygiene includes cleansing hands by rubbing with alcohol-based hand sanitizer or washing with soap and water to prevent microbial growth. Despite its simplicity, compliance has been poor and faulty behavioural development during medical training has been identified as a central cause.

Studies show poor compliance: only 29% of medical students could identify all indications for hand hygiene, with 17% compliance during OSCE sessions. Graf et al. demonstrated that only 33% of students could identify indications of hand hygiene. Feather et al. found only 8.5% of medical students washed their hands after patient contact during the final MBBS OSCE, increasing to 18.3% after handwashing signs were displayed.

In Dominica, only 44.12% of medical students wash their hands before eating, 3.53% after working on a cadaver, 55.29% after lab work, 68.24% after defecation and 62.94% after urination.

Statement of the Problem

There is a paucity of information regarding knowledge, attitude and practices of handwashing among Caribbean medical students, especially knowledge of the most important safety precaution measure. The observance of hand hygiene by medical students is hypothesized as being poor, yet knowledge and practice among medical students reflect future healthcare and the general populace. Thus, the need to assess knowledge of hand hygiene practice among students of BYCOHTECH.

Study Objectives

To assess the knowledge of hand hygiene practice among students of BYCOHTECH.

Specific Objectives

1. To assess the knowledge of hand hygiene among students of BYCOHTECH.
2. To determine the attitude of BYCOHTECH students towards hand hygiene.

3. To assess the hand hygiene practices among BYCOHTECH students.

Research Questions

1. What is the knowledge of hand hygiene among students of BYCOHTECH?
2. What is the attitude of BYCOHTECH students towards hand hygiene?
3. What are the hand hygiene practices among BYCOHTECH students?

Literature Review

Hand hygiene remains a fundamental component of infection prevention and control across healthcare and community settings. Its importance became more evident following the COVID-19 pandemic. WHO (2023) states hand hygiene is one of the most effective interventions for preventing infectious diseases and reducing healthcare-associated infections globally.

In educational environments, students are highly important due to frequent interpersonal interactions and shared facilities like lecture halls, laboratories, and hostels. Odibo et al. (2025) reported that inadequate hygiene practices among students contribute significantly to infectious diseases, increased absenteeism, and reduced academic performance.

Students in health-related institutions are expected to demonstrate higher knowledge and compliance due to future healthcare roles. However, Blomgren et al. (2024) show that even health sciences students display gaps in both knowledge and practical application, indicating that training alone is insufficient.

Concept of Hand Hygiene

Hand hygiene is the process of cleaning hands using soap and water or alcohol-based hand rubs to remove dirt, microorganisms, and contaminants. WHO (2023) defines it as a primary strategy for breaking the chain of infection transmission.

It is rooted in germ theory: removing or killing microorganisms reduces infection likelihood. Methods include handwashing with soap and water, alcohol-based hand sanitizers, and surgical hand antisepsis. Proper technique is essential; Blomgren et al. (2024) found that many individuals fail to scrub all hand surfaces or wash for an adequate duration.

The “Five Moments for Hand Hygiene” guides when to perform hand hygiene, particularly in clinical settings. Environmental factors like access to clean water, soap, and facilities also determine practice consistency.

Knowledge of Hand Hygiene among Students

Knowledge refers to understanding infection transmission, awareness of proper handwashing techniques, and the ability to identify when hand hygiene should be performed. WHO (2023) reported that although awareness is generally high, many lack detailed technical knowledge of correct procedures.

Blomgren et al. (2024) found that nursing students demonstrated only moderate knowledge despite formal training, with gaps in understanding duration and proper coverage. Balaraman et al. (2023) reported that medical students often lacked detailed knowledge of procedures despite recognizing their importance. Odibo et al. (2025) observed that university students had high awareness but limited knowledge of correct techniques, timing, and steps.

Knowledge varies with academic exposure; higher levels of clinical training improve understanding. Structured education through lectures and clinical demonstrations outperforms informal sources like social media.

Factors Influencing Knowledge and Practice

1. **Level of Education:** Higher academic levels show better understanding due to increased exposure. Blomgren et al. (2024) reported that advanced students had higher knowledge scores.
2. **Health Education and Training:** Structured training and practical demonstrations significantly improve knowledge and practice. Balaraman et al. (2023) found that students with organized training performed better. Lack of continuous training contributes to poor application.
3. **Availability of Water and Soap:** Inadequate water supply limits practice, even when knowledgeable. Odibo et al. (2025) reported that institutional water shortages reduce compliance.
4. **Availability of Hand Sanitizers:** Accessible sanitizers improve compliance where water is unavailable. Narula et al. (2024) observed better hygiene practices in institutions with sanitizers.
5. **Behavioral Factors:** Forgetfulness, negligence, and lack of discipline affect compliance. Narula et al. (2024) identified forgetfulness as a common reason for poor compliance.
6. **Peer Influence:** Students adopt behaviors common within peer groups. Odibo et al. (2025) reported that peer neglect reduces individual compliance.
7. **Institutional Policies:** Strict hygiene policies and supervision increase adherence. Balaraman et al. (2023) found that schools with strong policies recorded higher compliance.
8. **Time Constraints:** Heavy workload and limited time reduce compliance. Narula et al. (2024) reported that students skip handwashing due to lecture/practical time pressure.
9. **Awareness Level and Information Sources:** Formal education yields a better understanding than social media. Blomgren et al. (2024) observed that formal education improves knowledge.
10. **Attitude and Risk Perception:** Students who perceive infection risk are more likely to practice proper hygiene. Odibo et al. (2025) found that risk perception increases compliance.

Empirical Review

- Labrague et al. (2018) systematically reviewed 3,000+ nursing students: moderate knowledge but low clinical compliance, significant knowledge-practice gap.
- Purssell and Gould (2022) reviewed 2,000+ students: training improved knowledge initially but declined without continuous reinforcement.
- Shyaka et al. (2024) global scoping review of 50+ studies: knowledge levels varied from low to moderate, attitudes generally positive. Recommended standardized education programs.
- Muiru (2018) cross-sectional study of 384 medical students: the mean knowledge score 49.4%, and overall practice was poor due to inadequate facilities.
- Gore et al. (2018) comparative study of 300 medical, dental, and nursing students: medical students had slightly higher knowledge but low compliance across all groups.
- Gould and van de Mortel (2017) review of 2,500 student nurses: inconsistent compliance due to poor role modeling and lack of supervision.

Methodology

Study Design

A cross-sectional study design was used to assess knowledge of hand hygiene practice among students of BYCOHTECH.

Study Area

Bayelsa State College of Health Technology in Otuogidi, Bayelsa, Nigeria. Departments include Environmental Health Sciences, Community Health, Medical Lab Tech, Health Information Management, Occupational Health, Safety and Environmental Remediation, and Emergency Healthcare.

Population

The population of the study includes all registered students from BYCOHTECH. Students who voluntarily gave oral consent. It excluded students unwilling or incapable of giving consent.

Sample Size and Sampling: Taro Yamane's formula used. $N = 986$, $\alpha = 0.05$. $n = 986 / [1 + 986(0.05)^2] = 285$. Purposive and random sampling was adopted by departments:

Step 1 - Purposive identification of departments.

Step 2 - Proportionate identification of participants.

Step 3 - Proportionate sample size from each department.

Step 4 - Simple random sampling.

Instrument

A self-structured questionnaire was designed with four sections: A) Demographics, B) Knowledge of hand hygiene, C) Attitude towards hand hygiene, D) Hand hygiene practices.

Validity & Reliability

Face and content validity by the supervisor and experts. The test-retest reliability method was used.

Data Collection

Two research assistants were recruited. Questionnaires were distributed to consenting participants after full information.

Data Analysis

Data coded and transferred to SPSS version 21. Descriptive statistics - percentages for each response. Results presented in tables and charts.

Ethical Consideration: Ethical approval from BYCOHTECH Ethics and Research Committee. Verbal consent obtained. Information solely for academic purposes. Confidentiality was strictly adhered to. Participants could withdraw anytime.

Results

Demographic Data

The majority were young: 36.8% aged 15–24 years, 26.3% each for 25–34 and 35–44 years, 10.5% were 45+. All respondents (100%) were female. Marital status: 57.9% married, 21.1% single, 10.5% each divorced and widowed. Education: 73.7% secondary, 15.8% primary, 5.3% each no formal and tertiary. Work experience: 57.9% had 1–5 years, 21.1% each 6–10 years and >10 years.

Knowledge of Food/Hand Hygiene

Using a 4-point Likert scale, high agreement with all statements. Mean scores 1.26–1.95 within “Accept” range. Respondents strongly agreed: washing hands prevents contamination (Mean = 1.26), food hygiene means keeping food clean/safe (Mean = 1.47), contaminated food causes food-borne diseases (Mean = 1.63), covering food prevents flies/dust contamination (Mean = 1.58), and dirty utensils transmit disease (Mean = 1.95).

Food Handling and Preparation Practices

42.1% always wash hands before preparing food, 31.6% sometimes, 10.5% rarely, 15.8% never. 57.9% always use clean water for cooking, 36.8% sometimes, 5.3% rarely. 89.5% always reheat leftover food, 5.3% sometimes, 5.3% never. 68.4% always separate raw from cooked food, 31.6% sometimes. 21.1% always wash utensils immediately, 73.7% sometimes, 5.3% never.

Personal Hygiene Practices

42.1% always wash hands after toilet use, 36.8% sometimes, 5.3% rarely, 15.8% never. 78.9% always keep fingernails short/clean, 15.8% sometimes, 5.3% never. 26.3% always wear clean apron while selling food, 42.1% sometimes, 31.6% never. 31.6% always cover hair while preparing food, 57.9% sometimes, 10.5% never. 10.5% always undergo medical check-ups, 26.3% sometimes, 5.3% rarely, 57.9% never. 21.1% always use utensils to serve food, 73.7% sometimes, 5.3% rarely.

Discussion, Conclusion, and Recommendations

Discussion

The high knowledge scores align with the WHO (2023), which states that awareness of hand hygiene is generally high, yet gaps exist in practice. While 42.1% always wash their hands before food preparation and 57.9% always use clean water, 15.8% never wash their hands before food and 15.8% never wash their hands after toilet use, indicating a knowledge-practice gap consistent with Labrague et al. (2018) and Muiru (2018).

The 100% female sample reflects food vending demographics in the study area. The 57.9% who never undergo medical check-ups is concerning for public health, as vendors can be asymptomatic carriers. Low compliance in apron use (26.3% always) and hair covering (31.6% always) mirrors findings by Balaraman et al. (2023) that behavioral and environmental factors impede practice despite knowledge.

The disparity between knowledge (Means 1.26-1.95 indicating strong agreement) and practice (only 42.1% always wash hands after toilet) supports Narula et al. (2024) that knowledge retention and application remain challenges. Factors like time constraints, lack of facilities, and poor institutional enforcement likely contribute.

Conclusion

Students of BYCOHTECH demonstrate high theoretical knowledge of hand hygiene and food safety principles. However, significant inconsistencies exist in practice, particularly in handwashing after toilet use, use of protective clothing, hair covering, and regular medical check-ups. The knowledge-practice gap highlights that awareness alone is insufficient without an enabling environment, continuous reinforcement, and behavioral change strategies.

Recommendations

1. Continuous Education: Integrate practical hand hygiene demonstrations into the curriculum with regular refresher training.
2. Infrastructure: The institution should provide adequate handwashing stations with soap and water, and alcohol-based sanitizers in classrooms and hostels.
3. Policy Enforcement: Implement and enforce institutional hand hygiene policies with monitoring and role modeling by lecturers.
4. Behavioral Interventions: Address forgetfulness and time constraints through reminders, posters at critical points, and peer-led campaigns.

5. Medical Screening: Mandate periodic medical check-ups for students involved in food handling.
6. Further Research: Conduct observational studies to validate self-reported practices and assess microbiological contamination.

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