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# Clinical Audit Report for Evaluating Compliance of WHO-Based Hand Hygiene Performance in a Tertiary Care Setting

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**Abstract:** Healthcare-associated infections (HAI's) critically threaten patient safety worldwide. This prospective, observational quality improvement clinical audit evaluated 104 healthcare professionals across General and Surgical inpatient wards over 6 months using pre- and post-intervention designs. Independent observers recorded 240 unannounced hand hygiene opportunities assessing WHO Five Moments compliance, product use, and glove utilization. Following targeted hand hygiene training, compliance improved by 11% overall (from 79.3% to 90.3%). Adherence varied significantly across WHO moments, peaking after body fluid exposure risk (82.2%) and dropping lowest following contact with patient surroundings (37.8%), highlighting the need for targeted clinical interventions.

**Keywords:** Text classification, Clinical Audit, Hand Hygiene, Pakistani Hospital, Quality Improvement Report.

## INTRODUCTION

To standardize global practices, the WHO introduced the 'Five Moments for Hand Hygiene' framework, defining accurate clinical indications for decontamination for pre-post- patient contact or aseptic procedures [1]. Clinical audits provide an essential quality improvement mechanism to evaluate baseline practices, identify specific operational and behavioral barriers, and drive targeted interventions [2]. Clinical Audit of hand hygiene has already been done in Pakistan [3] but in that study, only the Intense Care Unit (ICU) was taken as full settings of the study population. Here in the present clinical audit, the entire hospital with healthcare professionals has been taken as the setting and population of the study. Fulfilling the gap of setting to a broader range, clinical audit was initiated to systematically evaluate healthcare professionals' compliance with the WHO Five Moments and essential hand hygiene techniques [4] across the hospital (surgery and general wards), providing an empirical basis for actionable quality improvement. The study Measures the acceptance rates across the WHO Five Moments for Hand Hygiene in Pakistani hospital. The study also assesses the hand wash by taking the products (hand- rub and hand- soap) with or without the use of glove practices.

## METHODOLOGY AND AUDIT TOOL

A prospective observational clinical audit was conducted over a three- week duration in August 2026 across two major inpatient units (general ward and surgery ward) in a private-

Pakistani hospital. Trained infection control observers utilized the standardized WHO-Based Hand Hygiene Clinical Audit prepared questionnaire prepared and taken from "WHO Guidelines on Hand Hygiene in Health Care" [5] to record healthcare professionals' behaviors during routine patient care activities. Observations were unannounced to mitigate Hawthorne bias. Data collected included facility details, healthcare professional's category (nurses, doctors and technicians), taking N = 104 participants to check adherence to the WHO Five Moments, performance of specific friction and drying steps, glove hygiene compliance, and resource availability. Data was taken cross-sectional at two timelines i.e. in the pre- intervention observation stage where the data was collected observing N = 210 participants. Then, the intervention stage came where the targeted participants (N = 122) were invited to attend the seminar about education- and training of Hand- Hygiene Techniques recommended by WHO. Out of 122, only N = 104 participants attended the intervention. The second phase of observation was started after 3 months for those participants who attended the intervention and their particular observations were noted. For the observations, the confederates were hired from outside the hospital and they were trained to note the particular 5- Hand Hygiene Moments performed, not performed or neglected by the targeted participants (Healthcare Professionals). The pre- and post-intervention data of the targeted participants (N = 104) was collected and it was subjected to Excel file and SPSS- 27 for further analysis to check the percentage of improvement in Hand- Hygiene compliance.

## AUDIT RESULTS AND FINDINGS

Below is given the detail of percentages of Pre and Post Compliance to WHO- HAND- WASH- 5 MOMENTS for the present Quality Improvement report. A pre- intervention compliance percentage for male and female participants improved for post- intervention compliance as shown in Table 1 below.

**Table 1: Percentages of Pre- and Post-Compliance of Study Variables (N = 104)**

| **Variables** | ***Male*** | ***Female*** | **Total** |
|---|---|---|---|
| | *(%)* | *(%)* | *%* |
| WHO- HAND- WASH- 5 Compliance | | | |
| Pre- Compliance | *34.1* | *45.2* | *79.3* |
| Post- Compliance | *41.7* | *48.6* | *90.3* |

***Note***. *N* = 104.

Below is given the Cluster Bar chart for the improvement percentage of pre- post Compliance rate in males and female participants

Figure 1: Demograpic Interaction across Pre- and Post-Intervention Percentages among Gender of the present study (N = 104)

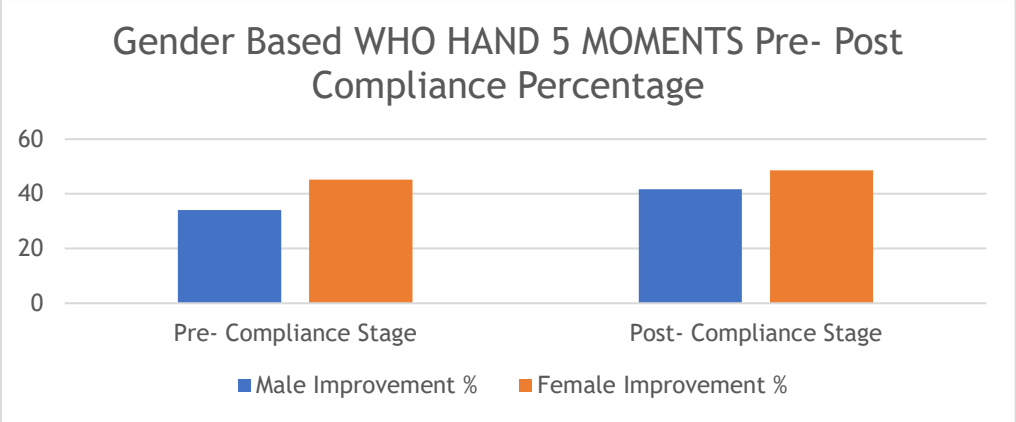



**Figure 1: A significant percentage change can be seen among male participants who showed more compliance post- intervention then pre- intervention. Similar trend worked for the female participants as well Overall, the Quality Improvement Project (QIP) for the Hand- Hygiene - 5 moments of WHO worked accordingly to improve the compliance percentage among healthcare professionals.**

## DISCUSSION AND CONCLUSION

The findings of this quality improvement audit report suggest that the education and training seminar, followed by continued observation, was associated with improved hand-hygiene behavior among doctors, nurses, and technicians in both general and surgical wards. Improvement in both male and female participants further indicates that the intervention was broadly applicable across the participating healthcare-professional groups in the chosen Pakistani hospital. The baseline compliance rate of 79.3% was relatively encouraging; however, it still indicated missed hand-hygiene opportunities that could contribute to healthcare-associated infections [6].

Variation between WHO hand-hygiene moments is clinically important as higher adherence after exposure to body-fluid risk may reflect healthcare professionals' awareness of personal contamination and self-protection [7]. In contrast, lower adherence after contact with patient surroundings suggests that environmental contact may be perceived as less risky, despite its recognized role in transmission of microorganisms [8]. Future interventions should particularly emphasize Moments 1 and 5, including hand hygiene before touching a patient and after touching patient surroundings, because these moments protect both patients and healthcare workers from cross-transmission. Overall, the audit supports structured hand-hygiene education as a practical quality-improvement strategy in this setting. Sustained improvement should include regular refresher training, visible reminders at the point of care, adequate availability of alcohol-based hand rub and soap, audit-and-feedback cycles, and ward-level reporting of compliance by each WHO moment. Repeating the audit at scheduled intervals and linking compliance data with healthcare-associated infection rates would provide stronger evidence of the intervention's long-term clinical impact.

**Ethics approval** — BSTH-56743/ERB/07- March to December, 2026.

**Consent to participate and consent to publish** — Consent to participate was taken from participants on demographic sheet.

**Trial registration** — NA

**Data availability** — Data is available upon request from authors.

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**Conflicts of interest** — None

**Author contributions** — Mohamed Abdirehman Ali: Conceptualization, Methodology, Investigation (data collection coordination), Writing – Original Draft Preparation. Zahid Rasheed: Conceptualization, Methodology, Supervision, Software, Formal Analysis, Writing – Review & Editing. Muhammad Arsalan Khan Niazi: Methodology, Investigation, Data Curation, Writing – Review & Editing. Muhammad Khalid: Validation, Investigation, Resources, Project Administration. Shehryar Khan Niazi: Investigation, Data Curation, Software, Writing – Review & Editing. Shah Faisal: Validation, Resources, Visualization, Supervision, Writing – Review & Editing.

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