

Profiling Hand Hygiene Adherence in an Outpatient Clinic Setting

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Abstract

Infection prevention and control (IPC) represents a critical priority in healthcare delivery, with hand hygiene serving as a key quality indicator. This study aimed to profile hand hygiene compliance at Clinic X in Makassar City. A descriptive cross-sectional study was conducted involving 32 healthcare staffs, including clinicians, allied health professionals, and support staff, selected through total sampling. Data collection employed direct observation using a standardised checklist based on the WHO "Five Moments" framework and the six-step hand hygiene technique. The overall hand hygiene compliance rate was 96.05%. Moment-specific analysis revealed perfect compliance (100%) after contact with patients, body fluids, and patient surroundings. However, compliance before patient/specimen contact was 91.5%, and notably, no hand hygiene opportunities were observed before aseptic procedures during the study period. Alcohol-based hand rubs were the predominant method (84.47%) compared to hand washing with soap (15.53%). Despite exemplary overall compliance supported by a robust safety culture, significant vulnerabilities persist in procedural infection prevention. The disparity between reactive and proactive hand hygiene highlights the need for targeted interventions, particularly through enhanced clinical auditing prior to aseptic procedures. Further investigation into the behavioural determinants underlying these compliance gaps is strongly recommended.

Keywords: Hand Hygiene; Handwash; Handrub

INTRODUCTION

Healthcare facilities which provide promotive, preventive, curative, and rehabilitative healthcare services have the potential to pose a risk of disease transmission to everyone within them. Therefore, ensuring the safety and health of human resources, patients, visitors, and the environment is a must [1]. The healthcare system worldwide has increasingly focused on enhancing quality, particularly in alignment with Sustainable Development Goal 3, Target 3.8, which emphasises universal health coverage and access to quality essential healthcare services [2]. Patient safety is fundamental to the provision of high-quality healthcare services, significantly impacting patient results and the effectiveness of clinical interventions [3]. An important aspect of patient safety is adherence to infection prevention and control protocols, in which hand hygiene is considered a fundamental principle for reducing infections that occur during patient care and improving overall treatment outcomes [4], [5].

According to the WHO, the risk of patients becoming infected during hospital care is twice as high in Low and Middle Income Countries (LMICs) compared to High Income Countries (HICs). Nearly 30% of ICU patients experience HAIs, with incidence rates 2–20 times higher in LMICs than in HICs. An estimated 136 million antibiotic-resistant HAIs occur each year. Mortality among patients with resistant microorganisms is two to three times higher than among patients with sensitive microorganisms. WHO and OECD estimate up to 3.5 million deaths annually from HAIs by 2050. Effective implementation of infection prevention and control (IPC) programmes could prevent 821,000 deaths per year by 2050. In LMICs, improved

IPC could prevent at least 337,000 AMR-related deaths annually [6]. Indonesia is classified as an LMICs, meaning it belongs to a group with a higher prevalence of HAIs. The biggest challenges are the uneven implementation of Infection Prevention and Control (IPC) programmes, limitations in national HAI surveillance, and a lack of IPC training in primary facilities and regional hospitals. Indonesia faces problems related to infections occurring in healthcare facilities. Research on risk management in hospitals shows that the important role of the healthcare system and a safe working environment greatly helps in reducing these risks [7].

Hand hygiene as the most effective and fundamental measure to prevent the transmission of pathogens and reduce HAIs [8], [9]. Numerous investigations have underscored the critical importance of hand hygiene compliance, particularly within hospital settings; however, there remains a notable paucity of data specifically addressing the outpatient environment [10], [11]. Efforts made by implementing the WHO's multimodal hand hygiene improvement strategy, which includes system changes, knowledge enhancement, evaluation, promotion, and the establishment of a culture of safety, aim to increase compliance with hand hygiene and reduce infections occurring due to healthcare services [12]. A study showed that hand hygiene compliance increased from 44% to 94% within three weeks after implementing this strategy [13]. Research in West Kalimantan shows that 63% of nurses comply with proper hand hygiene, while 37% still do not perform hand hygiene according to SOP [14]. In addition, research in primary care in Tangerang Regency shows that the percentage of hand hygiene compliance is still below the Ministry of Health's target, even though the percentage of health workers who comply is higher than those who do not comply [15]. Hand hygiene can save millions of lives each year when performed with the right steps and at the right moments in healthcare facilities. Research from the OECD shows that in 34 OECD and EU/EEA member countries, every US\$1 spent on hand hygiene in healthcare facilities will yield an economic benefit of approximately US\$24.6. This will increase service productivity and the efficiency of healthcare cost management [16].

Clinic X is a healthcare facility in Makassar City that provides specialist services to the community. In delivering medical treatment and therapy, infection prevention and control are crucial aspects that require attention. Although hand hygiene practices have been implemented at Clinic X, no research has yet analysed staff compliance with these protocols. Therefore, this study aims to profile hand hygiene compliance in the outpatient clinic by analysing compliance levels of hand hygiene among healthcare and non-healthcare workers.

METHODS

This study employed descriptive research with cross-sectional approach to capture a snapshot of hand hygiene compliance at a single point in time. The study population comprised 32 healthcare staffs, including clinicians (e.g., doctors, nurses, midwives), allied health professionals (e.g., physiotherapists, occupational therapist, speech therapist, and pharmacists), and support staff (e.g., administrative and cleaning personnel). A total sampling technique was utilized, encompassing all eligible staff during the study period August 2025 at Clinic X.

Data collection was conducted through direct observation. Adherence was assessed based on performance according to the Five Moments for Hand Hygiene and the correct execution of the six-step hand hygiene technique. Staff were recorded as compliant only when both criteria were met. The observation data were subsequently recorded and compiled using Google Forms. The collected data were analyzed using Ms. Excell and IBM SPSS Statistics Version 27. Descriptive statistics were used to summarize the overall compliance rate and compliance

rates for each of the WHO 'Five Moments,' as well as the demographic and professional characteristics of the observed staff.

According to Minister of Health Regulation No. 30 of 2022, hand hygiene compliance is calculated using the following formula [1] :

$$\text{Compliance (\%)} = \frac{\text{Number of hand hygiene actions performed}}{\text{Total number of hand hygiene opportunities that should have been performed during the observation period}} \times 100\%$$

RESULTS

Table 1. Characteristics of the Study Participants (N=32)

Characteristic	Category	n	%
Age (Years)	21-26	6	18.8
	27-32	14	43.8
	33-38	3	9.4
	39-44	4	12.5
	45-50	3	9.4
	≥51	2	6.3
Gender	Male	13	40.6
	Female	19	59.4
Profession	administrative staff	2	6.3
	pharmacist	2	6.3
	midwife	2	6.3
	nurse	2	6.3
	doctor	8	25
	physiotherapist	5	15.6
	occupational therapist	4	12.5
	speech therapist	3	9.4
	cleaning service	4	12.5

Table 1 shows that most participants were aged 27–32 years (43.8%), and the majority were female (59.4%). The largest professional group was doctors (25%), followed by physiotherapists (15.6%), occupational therapists (12.5%), and cleaning service staff (12.5%). This indicates a predominance of young female healthcare workers with varied professional backgrounds.

Table 2. Frequency Distribution of Hand Hygiene Actions based on Indications or Moments

Indikasi/Momen	Performed		Not Performed		Total Opportunities	
	n	%	n	%	n	%
Before contact with patient/specimen	97	91.5	9	8.5	106	100%
Before performing aseptic procedure	0	0	0	0	0	0%
After exposure to patient body fluids/specimen	9	100	0	0	4	100%
After contact with patient/specimen	99	100	0	0	99	100%
After contact with patient surroundings	19	100	0	0	19	100%

Table 2 shows the frequency distribution of hand hygiene actions based on the five World Health Organization indications. Hand hygiene was most frequently performed before contact with patients or specimens (91. 5%), and in all instances after exposure to body fluids (100%), after contact with patients (100%), and after contact with patient surroundings (100%). However, no aseptic procedures have been done during observation period (0%). This indicates high compliance after patient related activities but poor adherence before contact with patient/specimen.

Table 3. Distribution of Hand Hygiene Compliance and Hand Hygiene Methods

Variable	Category	n	%
Compliance	Compliant	219	96.05
	Non-compliant	9	3.95
Hand Hygiene Method	Handwashing	34	15.53
	Handrubbing	185	84.47

Table 3 presents the distribution of hand hygiene compliance and methods used. The majority of participants demonstrated high compliance (96. 05%), while only 3.95% were non-compliant. In terms of the hand hygiene method, Handrubbing (84. 47%) was more frequently performed than Handwashing (15. 53%).

DISCUSSIONS

The majority of participants were within the productive age group, a demographic often associated with increased energy levels and a greater aptitude for adopting novel protocols. Nevertheless, maintaining adherence to hand hygiene practices continues to be a persistent challenge across all demographic profiles [17], [18]. This study involved various professions such as doctors, nurses, midwives, pharmacists, physiotherapists, occupational therapists, speech therapists, administrative staff, and cleaning services, and found that non-compliance with hand hygiene before interacting with patients was carried out by doctors. The present finding is consistent with prior research that has highlighted varied compliance rates among different professional groups, often showing lower adherence among medical staff compared to nursing or ancillary personnel [19].

Hand hygiene procedures are carried out using soap and running water when hands are visibly dirty or contaminated with bodily fluids (handwashing) and using alcohol-based liquids (alcohol-based hand rubs) when hands are not visibly dirty [20]. Hand hygiene must be performed according to the established 'Five Moments' and the correct 'Six Steps' technique. The recommended duration for alcohol-based hand rubbing is 20-30 seconds, while handwashing with soap and water requires 40-60 seconds. Furthermore, healthcare workers must ensure that their nails are kept short and clean and must refrain from wearing any hand jewellery during patient care activities [21]. Conversely, the notable diminished compliance prior to patient contacts and at the time of data collection, there were no aseptic actions taken by medical personnel, so the chance of hand hygiene before performing aseptic actions was 0%. The most highlighted discrepancy lies in the critical "before patient contact" moment, where adherence rates significantly declined, suggesting a prevalent oversight in proactive infection prevention [22]. This finding suggests a gap in the understanding or application of preventative measures, as opposed to reactive responses, within the clinical workflow[23]. This imbalance between

reactive and proactive hand hygiene practices highlights a potential area for targeted educational interventions and reinforces the necessity of continuous monitoring to reinforce adherence to all five moments[24][25]. Such interventions should emphasise the intrinsic value of pre-patient contact hand hygiene in preventing pathogen transmission rather than solely relying on post-contamination responses [26], [27].

The exceptional overall hand hygiene compliance rate of 96.05% demonstrates the effective implementation of infection prevention and control protocols at Clinic X. This high level of adherence is underpinned by a robust patient safety culture, championed by the clinic's Quality and Patient Safety team and embraced by all staff members. Furthermore, this success is facilitated by the strategic infrastructure, which includes readily accessible handwashing stations equipped with running water, soap, and visual guides for the correct handwashing technique. The placement of alcohol-based hand rub dispensers at strategic points throughout the clinic ensures easy accessibility for both healthcare workers and patients, thereby supporting consistent compliance. This comprehensive approach significantly contributes to the high compliance rates observed creating an environment where adherence to hand hygiene protocols is not only expected but also actively supported and facilitated [26].

The implementation of a structured morning briefing, which systematically reinforces hand hygiene protocols according to the WHO 'Five Moments' framework, is a key factor underpinning the high compliance rates observed in this study. This practice of daily reinforcement is supported by existing literature, which demonstrates that such consistent reminders foster a culture of safety and vigilance among healthcare staff [28], [29]. Consequently, this institutional habit directly contributes to sustained high adherence and enhanced patient safety outcomes [30].

CONCLUSIONS

This study evaluated hand hygiene compliance in an outpatient clinic setting in Makassar, Indonesia. The results demonstrated an exceptionally high overall compliance rate of 96.05%, with appropriate preferential use of alcohol-based hand rubs (84.47%) over handwashing, consistent with WHO recommendations for effective infection prevention. However, this commendable aggregate compliance masked a critical patient safety vulnerability. A significant deficit was identified in adherence to hand hygiene practices before patient contact, with particularly concerning compliance gaps in the latter. This stark contrast between near-perfect reactive hygiene (following patient contact) and inadequate proactive hygiene (preceding patient interaction) underscores a fundamental imbalance in infection prevention practices.

These findings highlight the necessity for targeted interventions that specifically address the identified compliance gaps. We recommend implementing focused educational campaigns, competency based training, and regular clinical audits that emphasize the crucial importance of hand hygiene before patient contact. Furthermore, future research should employ mixed-methods approaches to comprehensively explore the behavioral, contextual, and systemic determinants underlying these specific compliance deficiencies. Such investigations would provide valuable insights for developing more effective, tailored strategies to bridge this critical patient safety gap and ensure comprehensive adherence to all components of hand hygiene protocols.

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