



## Clean Hands, Dirty Truths: A Qualitative Study of Healthcare Professionals' Hand Hygiene in Public Hospitals of Lahore Before and During COVID-19

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*This qualitative research investigates the hand hygiene knowledge and practices of healthcare professionals in public hospitals, as well as how the COVID-19 pandemic affected their knowledge and practices in this area. The study conducted 20 in-depth interviews with medical staff working in public tertiary care facilities in Lahore, Pakistan. The results show that while healthcare workers possess a basic understanding of hand hygiene, they exhibit lower compliance with hand-washing practices, which is attributed to inadequate hand hygiene facilities and a heavy workload. Despite increased funding to hospitals during the pandemic, the findings suggest that the COVID-19 pandemic increased healthcare practitioners' awareness of hand hygiene and its importance, but it did not lead to a significant improvement in hygiene practices due to increased workload and inadequate facilities.*



## Introduction

Every day, hundreds of individuals around the world acquire infection or die from infections while receiving medical care. Health care workers' contact to microbes is the main source of hospital acquired infections (HCAIs), which can be prevented by washing hands (Haque et al., 2020; Buković et al., 2021). In the medical field, hands are thought to be one of the common ways for people to spread diseases to one another (Kebede, 2020; Khan et. al., 2017). Therefore, preventing the transmission of hospital infections and improving patient health both require healthcare workers to practice good hand hygiene (Glowicz, et. el., 2023; Porzig-Drummond et. al., 2009). Healthcare professionals involved in patient care, whether directly or indirectly, should prioritize hand hygiene (Gaubé et al., 2021).

Research suggests that hand hygiene is effective in reducing cross-infection in hospitals, even though healthcare workers (HCWs) may not consistently adhere to hand hygiene procedures (Hillier, 2020). To ensure good hand hygiene practices, quick and simple assessments of both skin protection and hand hygiene are necessary. Hand hygiene refers to the act of washing one's hands to remove dirt, oils, bacteria, and other unwanted materials. Regular handwashing with soap throughout the day can prevent many infections that spread via the fecal-oral route, such as diarrhea and cholera (Paludan-Müller et al., 2020). Practicing hand hygiene before approaching each patient or route is crucial for preventing or reducing infections (Ayran et. el., 2022; McGuckin & Govednik, 2013).

Infection control measures are crucial for reducing the risk of contamination in hospitals; however, few HCWs adhere to proper hygienic procedures (World Health Organization, 2021; Erasmus et al., 2010). Although the hands of caregivers are a common mode of viral transmission, maintaining basic personal hygiene can significantly lower the risk of transmission (Ayran et al., 2022; Sandora, 2005). Despite evidence-based guidelines for medical professionals, such as hand washing standards, compliance is often low. Health Care Associated Infections (HCAIs) pose a significant threat to public health, and can result in increased medical costs, mortality, and morbidity rates (Tolera et. el., 2020; Haque et al., 2018).

HCWs hands come into contact with a variety of objects and surfaces throughout their workday, including inanimate objects, preserved or undamaged patient skin, mucous membranes, food, trash, body fluids, and even themselves (Dabholkar et. el., 2020; Challenge, 2009). The outbreak of the highly contagious COVID-19 pandemic has increased the risk of disease transmission. The current study aims to assess HCWs' adherence to hand hygiene standards and identify factors that may contribute to non-compliance, particularly during the COVID-19 pandemic. The study was conducted in light of the heightened risks that diseases like COVID-19 pose to healthcare facilities and the critical role of good hand hygiene practices in preventing the spread of infectious diseases.



## Literature Review

Several studies have demonstrated the crucial role that healthcare workers' hands play in transmitting infections among patients within a hospital setting (World Health Organization, 2021). Proper hand hygiene practices are considered fundamental to preventing healthcare-associated infections, based on research and evidence of their effectiveness (Ayran et al., 2022). In addition, it is viewed as a simple and cost-effective method for reducing the spread of infections and contributing to a culture of patient safety (Sin & Rochelle, 2022; Allegranzi & Pittet, 2009).

The World Health Organization emphasizes the importance of implementing hand hygiene guidelines in healthcare settings to ensure that healthcare professionals can follow them effectively. These guidelines include techniques for hand hygiene, appropriate hygiene products, and access to water. To create a positive institutional culture around hand hygiene, it is also important to promote staff knowledge and monitor compliance (World Health Organization, 2021).

Healthcare-associated infections have significant negative impacts on patients, communities, and healthcare systems worldwide. Despite the proven effectiveness of hand hygiene in preventing these infections, healthcare professionals face obstacles to compliance, including lack of time, busy schedules, and a conservative perception of the hand hygiene regimen. Studies have shown that non-compliance increases with staff workload and interruptions (Jang et al., 2010).

Several studies have identified knowledge gaps in hand hygiene protocols among healthcare professionals (Shehu et al., 2019; Jang et al., 2010). These studies have concluded that lack of regular formal education, inadequate or outdated training, and insufficient training in hospitals are the main causes of these knowledge gaps. Poor quality of training material and instructors, as well as the length of training, were also identified as factors contributing to inadequate training. Additionally, lower cadre healthcare workers such as ward boys and orderlies had more knowledge gaps than senior healthcare professionals like doctors, and the human resource policies of hospitals also played a role.

Apart from knowledge gaps, lack of access to necessary resources can also influence poor hand hygiene compliance. Studies have shown that healthcare personnel who understand the importance of hand hygiene for both themselves and patients often feel constrained and frustrated by the lack of access to hand hygiene products (Harun *et al.*, 2022; Kamanga *et. el.*, 2022; Lakoh et al., 2022; Le et al., 2019). Hand hygiene supplies such as soap, sanitizer, wipes, gloves, and clean water are crucial for compliance. The study by Jang et al. (2010) also found that limited access to these materials discouraged healthcare workers from practicing proper hand hygiene, leading to a substantial decrease in their enthusiasm to adhere to the protocol.



The COVID-19 pandemic has significantly altered the medical community's understanding of the importance of human contact in preventing the spread of disease (Araghi et. el., 2020; Moore et. el., 2021). During the pandemic, hospitals placed stricter compliance requirements on healthcare workers, and the sense of self-protection among those in the industry increased. Although hand hygiene performance initially increased at the beginning of the pandemic due to a greater emphasis on its importance, a noticeably reduced workload as a result of fewer non-COVID-19 patients and hospital visitors, and a higher perception of risk to healthcare professionals and their families, improvements were not sustained, according to a study by Moore et al. (2021).

Studies (Gupta *et. el.*, 2020) have also shown that healthcare providers' increased compliance with hand hygiene during the pandemic is largely due to self-preservation. However, in addition to the lack of knowledge and resources, healthcare professionals faced other challenges, including allergies and medical reactions to hand hygiene products. Araghi's study (2020) found cases of hand dermatitis (a type of eczema that may cause skin dryness, itchiness, soreness, or bleeding) among healthcare providers due to the use or excessive use of certain products like sanitizers and disinfectants.

### **Research Methods**

This qualitative study aimed to explore the hand hygiene practices of healthcare workers (HCWs) at a public sector tertiary healthcare hospital in Lahore, Pakistan. The study utilized in-depth interviews with HCWs, and a semi-structured interview guide was developed with questions written in English and translated into Urdu, the local language.

The sample for the study was selected using a simple random sampling technique, and twenty participants were chosen. Data was collected through interviews, and after 17 interviews, data saturation was achieved. However, three additional interviews were conducted to confirm saturation. The semi-structured interview guide included questions related to hand hygiene practices, compliance, and non-compliance.

The interviews were conducted in Urdu, the local language, to ensure that participants felt comfortable and were able to express their thoughts and experiences fully. Subsequently, the interviews were translated into English for analysis. The interview transcripts were first analyzed to identify codes, which were then grouped into categories. Finally, themes were developed from the categories that showed connections. In addition to data on hand hygiene practices and compliance, some personal information such as the participants' designation, gender, and work experience was also gathered. Personal information is provided in parentheses following participant quotes during data analysis, and is categorized by profession (e.g. doctor, nurse, paramedic), name initial, gender (male, female), and years of experience. This approach enabled a more nuanced analysis of the data, as it allowed us to understand the factors that influence hand hygiene practices among healthcare workers from different backgrounds and experiences.

### **Findings**

The objective of this study was to examine the knowledge and practices of healthcare workers regarding hand hygiene in public hospitals before and during the



COVID-19 pandemic. Hand hygiene plays a vital role in reducing the risk of infection transmission, and healthcare professionals' comprehension of its importance and practice is crucial for safeguarding both patients and themselves. Through a review of the data, this study aimed to identify the healthcare workers' level of understanding of hand hygiene protocols and the barriers they may encounter in implementing them, both before and during the COVID-19 pandemic.

### **Hand Hygiene in Hospitals: Knowledge and Significance**

The participants' knowledge and understanding of the importance of hand hygiene in hospital settings were evaluated, and it was discovered that all participants possessed some level of comprehension of the necessary protocols and their significance. They were also aware of the importance of hand hygiene for both patients and themselves. One participant stated, "Hand hygiene not only protects patients but also saves us from acquiring infections ourselves." Another participant shared, "The probability of getting infections is reduced to a minimum if hand hygiene protocols are followed. We, as healthcare professionals, are all aware of it, whether we practice it or not" (PEF2).

Most participants highlighted how hand disinfection can disrupt the spread of disease from person to person. They emphasized that healthcare workers must adhere to hand hygiene measures, even during an infectious outbreak, to protect themselves, their patients, and others around them. Likewise, a participant added that "even a small act of hand disinfection could protect ourselves and other people around us from infections" (DAM10).

Although most of the participants had some understanding of the significance and protocols of hand hygiene, they acknowledged that its practice may be inadequate. Noncompliance with hand hygiene regulations is a significant contributor to the spread of infections (Delva et al., 2022). During the interviews, a participant stated, "We (HCWs) typically do not use gloves while treating patients; gloves are only used during surgery or wound treatment" (PMF2).

The participants emphasized the need for mandatory regular training and motivation of healthcare professionals across all types of hospitals and clinics. One participant expressed, "For proper practices of hand hygiene, it is necessary to educate HCWs and train them to ensure clean care. The uneven practice of protocols exposes both patients and HCWs to detrimental consequences. Additionally, it leads to the spread of diseases beyond patients and HCWs, to their families and communities at large. Adequate compulsory training should be provided to HCWs to ensure their compliance with hand hygiene protocols" (NFF8).

While most participants did not receive any training after starting their jobs, some admitted to attending training sessions and workshops on hygiene practices. "My colleagues and I have not received any training regarding hand hygiene at our workplace," shared one participant (PAM2).

Hospitals have the potential to facilitate the spread of various life-threatening infections, thereby increasing the risk of mortality and morbidity. Inadequate hand



hygiene is considered to be one of the leading causes of infection transmission. Proper hand hygiene practices can help reduce the spread of infections and protect hospital staff, patients, and visitors alike. One participant shared their personal experience of contracting Mycosis while providing patient care without gloves and highlighted the importance of practicing good hand hygiene to prevent such incidents. He shared:

I realized the importance of practicing good hand hygiene. Since then, I remain careful and follow all hygiene protocols while providing medical care to patients. By being careful, getting infected can be avoided (NSF6).

Another participant emphasized the essential role of hand hygiene in preventing infections, stating, "Nosocomial infections and hand hygiene have a fundamental relationship, so it is important to practice good hand hygiene to prevent cross-infections" (NSF3). Similarly, another participant stressed the importance of hand hygiene in the context of hospital-acquired diseases, saying, "Hand hygiene and hospital-acquired diseases are directly related. Therefore, failing to wash your hands will eventually result in infecting others. The recent COVID-19 outbreak also made this clear" (DJF6).

In short, good hygiene practices are critical to ensuring that healthcare professionals can provide high-quality care, reduce the spread of illnesses, and protect public health. To create a safe and hygienic healthcare environment, it is essential to understand the importance of comprehensive hygiene, infection prevention and control, and access to water and sanitation services.

### **Hand Hygiene Facilities: A Barrier to Proper Compliance**

The availability of hand hygiene facilities such as gloves, sanitizers, soaps, and clean water is crucial for healthcare workers to maintain proper hand hygiene practices. Governments and hospital administrations must prioritize providing these facilities to healthcare workers. Without access to appropriate facilities, it is nearly impossible for healthcare workers to maintain the necessary hand hygiene practices. During the study, participants were asked if they had access to sufficient hand hygiene facilities, and many reported inadequate access to these facilities in hospitals.

One participant (NSF4) expressed that the hospital administration fails to provide the necessary facilities to healthcare workers (HCWs) to perform their duties effectively. Another participant (NRF5) pointed out that there are no appropriate facilities for hand hygiene available at the location. Additionally, a participant (PUM2) stated that disinfecting products are not delivered in a timely manner when urgently needed. Another participant (PBM5) highlighted that some hospitals do not provide healthcare workers with disinfection products, forcing them to purchase these items themselves.

Failure to practice good hand hygiene before touching the eyes, nose, or mouth puts individuals at risk of respiratory illnesses such as the flu or the common cold. Poor hand hygiene can also lead to the spread of various skin infections, such as those affecting mucous membranes. Medical facilities cannot provide high-quality care without sufficient hygienic supplies. Noncompliance with hygiene requirements hinders the provision of safe services, which also increases the risk of infections spreading. Therefore, it is crucial



to give the highest priority to hand hygiene procedures, and healthcare facilities should have the necessary resources to ensure that these procedures are followed.

### **Impact of COVID-19 on Knowledge of Hand Hygiene Practices**

The outbreak of the COVID-19 pandemic has had a profound impact on how hospitals perceive infections and implement infection control protocols. Proper hand hygiene is crucial in reducing the transmission of infections and mitigating the risk of contracting diseases like COVID-19. The participants were interviewed about their understanding of the importance of maintaining good hand hygiene, particularly during the pandemic, and any possible factors contributing to non-compliance.

During the pandemic, people's awareness of hand hygiene was heightened through various sources, including medical and non-medical channels. All participants agreed that information on safety protocols, particularly hand hygiene, was ubiquitous through televisions, social media, posters, and banners in hospitals from health ministries and international organizations. The fear of the pandemic was widespread, including among healthcare workers, due to heightened public and hospital administration scrutiny and concerns about the risk of infection. As one participant stated, "In the initial stage, with so many people including hospital staff dying, this disease seemed to be a death trap" (NSF4). Another participant said:

At the onset of COVID-19, everyone was conducting research on various platforms such as social media, the internet, and newspapers due to the widespread fear. Hence, even in the absence of information from hospital administration, people were still informed about the significance of hand hygiene through other sources. Family and friends also shared information constantly through WhatsApp messages and videos. (NRF5)

The participants also talked about how misinformation and conspiracy theories surrounding the COVID-19 pandemic were spread and how this eroded people's trust in its reality and severity. Even medical professionals were impacted by this misinformation, causing them to feel uncertain..According to one participant,

During the COVID-19 pandemic, false information and conspiracy theories about the disease were spread, leading to a lack of confidence in its existence and severity. These false narratives even affected medical practitioners, causing uncertainty, for example, some of my coworkers were observed not wearing masks in wards and dismissing COVID-19 as a conspiracy of the West. (PBM5)

Another participant also added similar experiences:

Some of my colleagues held the belief that performing Wudu (washing before offering Muslim prayers) five times a day was sufficient for protection against infections, including COVID-19.



They would get offended if anyone insisted on hand hygiene, viewing it as a lack of faith in Allah. (DJF6)

### **Impact of COVID-19 on the Practices of Hand Hygiene**

The COVID-19 pandemic brought about changes to the Standard Operating Procedures of hospitals, especially with regard to the use of Personal Protective Equipment (PPE). PPE refers to specialized equipment used to protect healthcare workers from exposure to and transmission of pathogens in healthcare facilities. Examples of PPE include gloves, overalls, masks, and face shields. PPE acts as a barrier between healthcare workers and contaminants, thereby preventing the transmission of germs. It is crucial for hospital personnel, patients, and visitors to wear PPEs when in contact with patients, blood, or other bodily fluids. During the COVID-19 pandemic, the use of PPEs became even more essential.

According to the participants, the reason for noncompliance with hand hygiene during the COVID-19 pandemic was not due to a lack of knowledge, but rather a lack of facilities in hospitals. This shortage of facilities was not unique to Pakistan but was a global issue, including in developed countries. According to one of the participant:

During the COVID-19 pandemic, hospitals were overwhelmed with patients and there were limited hygiene products available for healthcare workers and patients alike. For instance, in some cases, there was only one hand sanitizer available for an entire ward. However, despite these challenges, hand hygiene practices among patients and healthcare workers increased significantly. The situation improved with time due to the government's initiative in implementing various measures. (NMF2)

Similarly, another participant highlighted:

Prior to the COVID-19 pandemic, essential and life-saving medical supplies for patient diagnosis and treatment were lacking in our government hospitals. In such situations, products for maintaining good hand hygiene were not considered a priority. Although the hospital administration attempted to make hygienic supplies and facilities available during the Covid-19 outbreak, the overall condition was still poor. (PNF4)

Infections tend to be more prevalent in critical care units, acute surgery wards, and orthopedic wards, where patients with advanced age, underlying health conditions, or undergoing chemotherapy are particularly vulnerable to infection. This viewpoint was echoed by one of the participants, who stated:

The COVID-19 pandemic has highlighted the importance of practicing good hand hygiene in healthcare settings. HCWs who treat patients with various illnesses, including COVID-19, can themselves become infected and unknowingly spread the virus to others. This can further impact vulnerable patients, coworkers, and even family members.



Moreover, medical equipment can also serve as a means of transmitting infections between individuals, thus putting both healthy individuals and in-patients at risk. The pandemic has underscored the crucial role of maintaining proper hand hygiene to prevent the spread of infections in hospitals and other healthcare facilities. (DAM5)

Many medical workers contracted infections during the COVID-19 pandemic, and some even lost their lives. It is well-known that doctors are already at risk of contracting various diseases due to the nature of their work. However, the COVID-19 pandemic has increased their risk significantly. A participant in the study discussed the risk perception before the pandemic and stated:

Even before the outbreak of the COVID-19 pandemic, HCWs were constantly exposed to the risk of infections due to the nature of their work. Owing to their hectic and demanding work schedules, they often neglected to pay strict attention to hand hygiene practices after interacting with patients. However, the pandemic has led to a change in their approach, and they are now more focused on taking appropriate precautions. The workload of HCWs can increase the likelihood of the virus spreading from patients to healthcare workers and, subsequently, to other patients who come into contact with the infected healthcare worker. (DIF7)

One of the participants emphasized the importance of proper disposal of contaminated PPEs, stating that only when gloves are used and discarded carefully can they be beneficial to both healthcare workers and the patients they are treating:

Only when gloves are used and discarded carefully can they be beneficial to both HCWs and the patients they are treating. COVID-19 pandemic drastically changed the way we practiced safety and used PPE. For example, prior to COVID-19 outbreak we used to use gloves to deal with multiple patients. This changed to using one glove per patient. We (HCWs) now understand that if a single glove is used on multiple patients, the germs can spread to the other patients as well. When the infected glove is used to touch the equipment, it leads to the spread of germs. (DZM8).

The participant continued, "The COVID-19 pandemic has brought about a new level of emphasis on PPE compliance in healthcare settings." Another participant echoed this sentiment, stating:

Due to the current epidemic, I now regularly wear personal protective equipment such as gloves, and I also advise my coworkers to do the same to protect themselves from germs and infections. Prior to the pandemic, many of us often disregarded PPE guidelines when providing care. (NAF4)

PPE plays a crucial role in ensuring the safety of healthcare workers and patients during the provision of care. PPEs not only help to minimize the transmission and incidence of viruses, but they also offer protection against other pathogens. In



compliance with regulations, hospitals are obligated to provide PPE to their healthcare workers as a preventive measure against the spread of diseases.

## Discussion

According to Toney-Butler (2019), cross-contamination from the hands of medical professionals to patients is a significant factor in the spread of Healthcare-Associated Infections. However, adherence to proper hand hygiene practices can effectively reduce this risk. A study conducted in a public tertiary healthcare setting in Pakistan provided insight into the hand hygiene habits of HCWs.

Previous studies have provided strong evidence of the positive impact of hand hygiene practices in reducing the spread of infections in hospitals (Toney-Butler, 2019; Porzig-Drummond et al., 2009). The current study found that all HCWs had a good understanding of hand hygiene procedures and their importance in reducing the risk of HAIs and other infectious diseases, which is consistent with earlier research (Fullan, 2008). However, despite this knowledge, the study found that HCWs did not always adhere to recommended hand hygiene practices. Factors such as understaffing, inadequate services, crowding, long shifts, lack of time, and unclear priorities contributed to low adherence to hand hygiene practices.

Proper hand hygiene is considered the foundation of all infection control programs since the hands of HCWs are the main agents of spreading infections to patients. Moreover, HCWs' desire to protect themselves is the primary motivation for practicing good hand hygiene (Borg et al., 2015). Evidence suggests that training healthcare workers on hand hygiene practices can significantly improve their knowledge and behavior regarding hand washing (Ekwere & Okafor, 2013).

Numerous initiatives, including educational campaigns, motivational services, seminars, and training, have been implemented by healthcare organizations to enhance hand hygiene compliance, but most have had only temporary or limited effects (Toney-Butler, 2017). Comprehensive strategies involving changes in behavior, society, and the organizations are proposed to promote hand hygiene. However, our study emphasizes that knowledge alone cannot achieve positive outcomes unless adequate resources and motivation is available. Our findings are consistent with a recent study that identified the lack of hand sanitizers and sinks as the primary barriers to hand hygiene compliance among nurses (Sandbøl et al., 2022).

## Conclusion

In conclusion, it is essential for every healthcare facility to implement proper hand hygiene procedures. Proper hand hygiene procedures are crucial in preventing the spread of infectious diseases. By practicing good hand hygiene, healthcare workers can significantly reduce the burden of infectious diseases, saving lives and reducing healthcare costs. Therefore, it is crucial to plan concerted efforts such as training seminars, and health education activities to make healthcare workers aware of the dangers of not following hand hygiene practices and potential cost savings from proper compliance. However, knowledge alone is not sufficient to achieve positive results until suitable resources are



provided. Despite the increased government spending and improved hand hygiene compliance in hospitals during and after the COVID-19 pandemic, these measures were not enough to cope with the increased burden on hospitals. This was mainly due to the increased burden on hospitals from the rise in the number of pandemic patients and continued shortage of resources.

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