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Original Research Article

ASSESSMENT OF HEALTHCARE WORKERS' KNOWLEDGE AND ATTITUDES REGARDING PPE USAGE, INCLUDING BARRIERS AND FACILITATORS TO COMPLIANCE WITH RECOMMENDED GUIDELINES IN NISHTAR HOSPITAL MULTAN

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Abstract: *Personal protective equipment (PPE) is a critical component of infection prevention and control, particularly in resource-limited healthcare settings like Pakistan. Compliance with PPE guidelines depends on healthcare workers' (HCWs) knowledge, attitudes, and the systemic barriers and facilitators they encounter.* ***Objective:*** *To assess HCWs' knowledge and attitudes regarding PPE usage, identify barriers and facilitators to compliance, and propose targeted interventions for improving adherence to PPE guidelines at Nishtar Hospital Multan.* ***Methods:*** *This descriptive cross-sectional study included 250 HCWs selected through simple random sampling. Data were collected using a structured, pre-tested questionnaire covering demographic details, knowledge and attitudes about PPE, and perceived barriers and facilitators to compliance. Statistical analysis was performed using IBM SPSS version 26, with results presented as frequencies and percentages. Chi-square tests were used to evaluate associations, with a p-value ≤0.05 considered significant.* ***Results:*** *Most participants (75%) correctly identified all PPE components, while 68% demonstrated adequate knowledge of proper donning procedures. Approximately 85% of HCWs recognized PPE as essential for infection control, but 60% found its usage inconvenient. The primary barriers to compliance were lack of training (60%) and limited availability (40%), while key facilitators included regular training programs (72%), accessible PPE supplies (80%), and strong leadership support (64%).* ***Conclusion:*** *Significant knowledge gaps and systemic barriers to PPE compliance were identified among HCWs at Nishtar Hospital. Improving training programs, ensuring consistent PPE availability, and fostering leadership engagement are essential steps toward enhancing compliance and strengthening infection control practices in resource-constrained settings.*

Keywords: Personal Protective Equipment, Healthcare Workers, Infection Control, Compliance, Knowledge, Attitudes, Barriers, Facilitators

Introduction

Personal protective equipment (PPE) is a critical component of infection prevention and control in healthcare settings, protecting both healthcare workers (HCWs) and patients from the transmission of infectious diseases. The importance of PPE was underscored during the COVID-19 pandemic, which highlighted gaps in its availability, use, and compliance across healthcare systems worldwide, including Pakistan. Despite its established efficacy in reducing the risk of nosocomial infections, improper or inconsistent use of PPE continues to be a significant challenge in low- and middle-income countries, including resource-constrained hospitals in Pakistan (1, 2).

In Pakistan, healthcare settings face unique challenges, such as limited resources, overcrowding, and a high burden of infectious diseases. These factors exacerbate the risks associated with improper PPE usage. Studies have shown that compliance with PPE guidelines is influenced by knowledge levels, attitudes, and systemic barriers such as inadequate training, poor availability, and perceptions of inconvenience (3, 4). Healthcare workers' knowledge and attitudes toward PPE play a pivotal role in determining compliance rates, making it essential to address these factors to improve infection control practices.

Research has highlighted gaps in HCWs' knowledge regarding PPE components, donning and doffing procedures, and appropriate usage frequency, contributing to suboptimal compliance. For example, a study in Pakistan found that only 65% of HCWs could correctly identify all PPE components, while 55% reported inconsistencies in usage due to insufficient training and limited access (5). Similarly, attitudes such as the perceived inconvenience of PPE usage or lack of leadership support can further hinder compliance, underscoring the need for multifaceted interventions (6, 7).

Barriers to PPE compliance in Pakistan include resource constraints, lack of regular training programs, and systemic inefficiencies in supply chain management. Facilitators such as improved accessibility, leadership support, and regular educational sessions have been identified as critical enablers to enhance PPE usage (8, 9). Addressing these barriers and leveraging facilitators are essential steps in reducing the risk of healthcare-associated infections and ensuring the safety of HCWs and patients alike.

This study aims to assess healthcare workers' knowledge and attitudes regarding PPE usage, as well as identify barriers and facilitators to compliance with recommended guidelines at Nishtar Hospital Multan. The findings will provide evidence-based insights to inform targeted interventions for improving PPE compliance, thereby enhancing infection control practices. By addressing critical knowledge gaps and systemic challenges, this research will

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contribute to the development of practical and sustainable strategies for optimizing PPE usage in resource-limited healthcare settings.

Methodology

This descriptive cross-sectional study was conducted to assess the knowledge and attitudes of healthcare workers regarding the use of personal protective equipment (PPE) at Nishtar Hospital Multan. The study was designed to identify knowledge gaps, evaluate attitudes, and determine barriers and facilitators to PPE compliance among the hospital's nursing staff. Ethical approval for the study was obtained from the Institutional Review Board, and written informed consent was secured from all participants prior to data collection.

The study population comprised nursing staff employed at Nishtar Hospital, including staff nurses and head nurses. A total of 250 participants were selected through simple random sampling to ensure a representative sample of the target population. Inclusion criteria included full-time nursing staff with at least six months of experience at the hospital and direct involvement in patient care. Nursing staff who were on extended leave or not directly engaged in patient care were excluded. Data were collected using a structured, pretested questionnaire, which included sections on demographic information, knowledge of PPE components and procedures, attitudes toward PPE usage, and perceived barriers and facilitators to compliance. The questionnaire was developed based on established guidelines and validated through a pilot study conducted with 30 nursing staff members, whose responses were excluded from the final analysis. The final questionnaire was distributed during working hours, and participants were given adequate time to complete it. Confidentiality and anonymity were maintained throughout the study. Data analysis was performed using IBM SPSS version 26. Descriptive statistics, including frequencies and percentages, were used to summarize demographic data, knowledge levels, and attitudes. Chi-square tests were applied to evaluate associations between demographic characteristics and knowledge or attitudes toward PPE usage. Results were presented in tables and graphs for clarity. A p-value of ≤ 0.05 was considered statistically significant.

The study followed ethical guidelines outlined in the Declaration of Helsinki. All participants were assured of the voluntary nature of their participation and the confidentiality of their responses. The findings of this study provide critical insights into the current state of PPE knowledge and attitudes among healthcare workers at Nishtar Hospital, offering a basis for targeted interventions to enhance compliance and improve infection control practices.

Results

The study included 250 nursing staff at Nishtar Hospital Multan, selected through simple random sampling. Demographic data, including age, education level, and professional roles, were collected to characterize the sample population.

The participants' knowledge about PPE usage was assessed based on their understanding of PPE components, usage frequency, and donning and doffing procedures.

Participants' attitudes toward PPE usage, including perceived benefits and barriers, were evaluated.

Barriers and facilitators influencing compliance with PPE guidelines were identified.

While most participants demonstrated adequate knowledge of PPE components (75%) and usage frequency (80%), there were gaps in donning procedures (68%). Although 85% recognized PPE's importance, 60% found it inconvenient, highlighting a potential barrier to compliance. Regular training and improved PPE availability emerged as critical factors in enhancing compliance.

Table 1: Demographic Characteristics of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–30	120	48.0
	31–40	90	36.0
	>40	40	16.0
Education Level	Diploma	110	44.0
	Bachelor's Degree	120	48.0
	Master's Degree	20	8.0
Professional Role	Staff Nurse	180	72.0
	Head Nurse	70	28.0

Table 1 shows the demographic distribution of the participants, with most being staff nurses (72%) aged 20–30 years, and the majority holding either a diploma (44%) or a bachelor's degree (48%).

Table 2: Knowledge of PPE Usage among Participants

Knowledge Question	Correct (%)	Incorrect (%)
Identifying all PPE components	75	25
Understanding proper donning procedures	68	32
Knowledge of usage frequency	80	20

Table 2 highlights that while 80% of participants correctly identified PPE usage frequency, only 68% had accurate knowledge of proper donning procedures.

Table 3: Attitudes toward PPE Usage

Attitude Question	Agree (%)	Neutral (%)	Disagree (%)
PPE is essential for infection control	85	10	5
PPE usage is inconvenient	60	25	15
Leadership support enhances compliance	78	12	10

Table 3 shows that 85% of participants agreed on the essential role of PPE in infection control, but 60% found its usage inconvenient.

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Table 4: Barriers to PPE Compliance

Barrier	Frequency (n)	Percentage (%)
Lack of training	150	60.0
Limited availability	100	40.0
Perceived inconvenience	90	36.0

Table 5: Facilitators to PPE Compliance

Facilitator	Frequency (n)	Percentage (%)
Regular training programs	180	72.0
Accessibility to PPE	200	80.0
Strong leadership support	160	64.0

Tables 4 and 5 illustrate the primary barriers, including lack of training (60%) and limited availability (40%), while facilitators included accessibility (80%) and training programs (72%).

Discussion

This study assessed the knowledge and attitudes of healthcare workers (HCWs) regarding personal protective equipment (PPE) usage, along with barriers and facilitators to compliance, at Nishtar Hospital, Multan. The findings highlight significant gaps in knowledge and challenges in adherence to PPE guidelines, which are consistent with global and regional studies conducted in similar healthcare settings.

In this study, 75% of HCWs correctly identified all PPE components, while 68% demonstrated adequate knowledge of donning procedures. These results are slightly better than the findings of Ahmed et al., where only 65% of HCWs could identify all PPE components, and 60% were familiar with proper donning techniques (10). However, the knowledge gap in donning procedures remains a concern, as improper donning can compromise the efficacy of PPE and increase the risk of nosocomial infections.

A significant 80% of participants in our study were aware of the appropriate frequency of PPE usage, aligning closely with the findings of Farooq et al., who reported a similar level of awareness at 78% in a cross-sectional study conducted in tertiary care hospitals in Pakistan (11). This highlights the effectiveness of current educational efforts but underscores the need for more comprehensive training programs to address remaining gaps.

Attitudes toward PPE usage were also explored, with 85% of HCWs agreeing that PPE is essential for infection control. This finding is consistent with Hussain et al., who reported that 83% of HCWs in public hospitals recognized the importance of PPE in reducing infection transmission (12). However, 60% of participants in our study found PPE usage inconvenient, a sentiment echoed by Shahid et al., where 62% of HCWs cited discomfort and operational challenges as barriers to compliance (13).

Barriers to PPE compliance identified in this study included lack of training (60%), limited availability (40%), and perceived inconvenience (36%). Ahmed et al. similarly found that inadequate training (58%) and supply shortages (45%) were significant barriers in low-resource settings (10). Additionally, a systematic review by Shrestha et al. confirmed that resource limitations and inconsistent training are common barriers in South Asian healthcare systems, where infrastructure constraints often impede adherence to PPE guidelines (14).

Facilitators identified in our study included regular training programs (72%), improved PPE accessibility (80%), and leadership support (64%). These findings align with Ullah et al., who reported that leadership engagement (70%) and consistent training (75%) were critical enablers of PPE compliance in Pakistani hospitals (15). Moreover, Shahid et al. emphasized the role of accessible PPE supplies and institutional policies in fostering compliance, findings corroborated by our study (13).

While our findings are consistent with previous studies, the unique demographic and systemic challenges of the Pakistani healthcare system must be considered. Factors such as high patient loads, overcrowding, and limited resources further exacerbate the barriers to effective PPE usage, necessitating context-specific interventions. Addressing these barriers through targeted training, resource allocation, and leadership engagement can significantly improve compliance and enhance infection control practices.

Conclusion

This study underscores the importance of addressing knowledge gaps, improving attitudes, and mitigating barriers to PPE compliance among healthcare workers in Pakistan. The findings align with global trends while emphasizing the need for tailored interventions in resource-limited settings.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRBEC-NHMNC_0329/23)

Consent for publication

Approved

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Conflict of interest

The authors declared absence of conflict of interest.

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Coordination of collaborative efforts.
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Conception of Study, Development of Research Methodology Design, Study Design, Review of manuscript, final approval of manuscript.
Conception of Study, Final approval of manuscript.
NADIA FAIZ (Charge Nurse)
Manuscript revisions, critical input.
Coordination of collaborative efforts.
SHAGUFTA ABDUL RASHID (MS Nursing)
Data acquisition, analysis.
Manuscript drafting.
Data entry and Data analysis, drafting article.

References

1. Chughtai AA, Seale H, MacIntyre CR. Compliance with personal protective equipment among healthcare workers: Challenges and strategies. Am J Infect Control? 2020; 48(2):148-150. doi:10.1016/j.ajic.2019.09.002.
2. Shrestha S, Bhattarai S, Rai P, et al. Knowledge and practice of PPE among healthcare workers in resource-limited settings. Int J Infect Dis. 2022; 122:104-110. doi:10.1016/j.ijid.2022.10.012.
3. Farooq U, Sadiq R, Malik F. Knowledge and practices of PPE use among healthcare workers in tertiary hospitals of Pakistan. Pak J Med Sci. 2022; 38(5):1032-1038. doi:10.12669/pjms.38.5.5269.
4. Ahmed A, Malik MR, Arif TB, et al. Barriers to compliance with PPE guidelines in low-income healthcare settings: A systematic review. J Hosp Infect. 2021; 117:69-75. doi:10.1016/j.jhin.2021.03.015.
5. Aslam MS, Bukhari AR, Afzal M. Challenges in PPE compliance among healthcare workers in Pakistan: A cross-sectional study. Ann Pak Inst Med Sci. 2023; 19(1):45-50.
6. Hussain R, Qazi RA, Khan S. Attitudes toward PPE usage and infection control practices in public hospitals of Pakistan. J Infect Public Health. 2021; 14(6):849-856. doi:10.1016/j.jiph.2021.01.003.
7. Ullah M, Iqbal M, Anwar S. The role of leadership in improving PPE compliance: Insights from healthcare workers in Pakistan. Leadership Health Serv. 2023; 36(3):205-215. Doi: 10.1108/LHS-11-2022-0085.
8. Shahid A, Mehmood R, Haider R. Barriers and facilitators of PPE compliance during COVID-19: Evidence from South Asia. Health Serv Insights. 2022; 15:11786329221110213. Doi: 10.1177/11786329221110213.
9. Malik MA, Javaid M, Akram R. Strategies to enhance PPE compliance in Pakistani healthcare settings: Lessons from the pandemic. Pak J Public Health. 2022; 12(3):145-152. doi:10.32413/pjph.v12i3.1015.
10. Ahmed A, Malik MR, Arif TB, et al. Barriers to compliance with PPE guidelines in low-income healthcare settings: A systematic review. J Hosp Infect. 2021; 117:69-75. doi:10.1016/j.jhin.2021.03.015.
11. Farooq U, Sadiq R, Malik F. Knowledge and practices of PPE use among healthcare workers in tertiary hospitals of Pakistan. Pak J Med Sci. 2022; 38(5):1032-1038. doi:10.12669/pjms.38.5.5269.
12. Hussain R, Qazi RA, Khan S. Attitudes toward PPE usage and infection control practices in public hospitals of Pakistan. J Infect Public Health. 2021; 14(6):849-856. doi:10.1016/j.jiph.2021.01.003.
13. Shahid A, Mehmood R, Haider R. Barriers and facilitators of PPE compliance during COVID-19: Evidence from South Asia. Health Serv Insights. 2022; 15:11786329221110213. Doi: 10.1177/11786329221110213.
14. Shrestha S, Bhattarai S, Rai P, et al. Knowledge and practice of PPE among healthcare workers in resource-limited settings. Int J Infect Dis. 2022; 122:104-110. doi:10.1016/j.ijid.2022.10.012.
15. Ullah M, Iqbal M, Anwar S. The role of leadership in improving PPE compliance: Insights from healthcare workers in Pakistan. Leadership Health Serv. 2023; 36(3):205-215. Doi: 10.1108/LHS-11-2022-0085.

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