Journal of Health and Rehabilitation Research 2791-156X JHRR

For contributions to JHRR, contact at email: editor@jhrlmc.com

Original Article

Assessment of Infection Control Practices among Healthcare Workers Working at Tertiary Care Hospital of Larkana, Sindh: A Cross Sectional Survey

Amjad Ali[1]*, Imtiaz Ali[2], Tanveer Ahmed Veesar[3], Noor Nabi Qureshi[4], Naveed Ali[5], Gul Shagufta[6]

[1]Medical Officer, Health Department, Government of Sindh, Paramedical Institute Larkana, Pakistan.
[2]Field Coordinator-Tuberculosis Control Program, Association for Social Development Lahore, Pakistan.
[3]District Health Coordinator, Pathfinder International, Pakistan.
[4]Medical Officer, Shiekh Muhammad Bin Zayed Al Nahyan Hospital Quetta, Pakistan.
[5]District Tuberculosis Officer, Communicable Disease Control Program, Tuberculosis Program Sindh, Pakistan.
[6]Registrar in Cardiology, Sheikh Mohammad Bin Zayed Al Nahyan Institute of Cardiology, Quetta, Pakistan.
Corresponding Author: Amjad Ali, Medical Officer; Email: dramjadtunio@gmail.com

Conflict of Interest: None.

Ali A., et al. (2024). 4(1): DOI: https://doi.org/10.61919/jhrr.v4i1.642

ABSTRACT

Background: The increasing prevalence of healthcare-associated infections (HCAIs) represents a significant challenge to patient safety worldwide, particularly in tertiary care settings where the risk of transmission is heightened. Effective infection prevention and control (IPC) practices, including hand hygiene, are pivotal in mitigating these risks. Despite the critical importance of these measures, adherence varies significantly across different healthcare settings, especially in low and middle-income countries.

Objective: This study aims to assess the knowledge, attitudes, and self-reported practices related to infection control among healthcare workers in a tertiary care hospital in Larkana, with a specific focus on hand hygiene practices. The study seeks to identify gaps in knowledge and practice that could be targeted to improve overall IPC measures within the hospital.

Methods: A cross-sectional survey was conducted among healthcare workers at a tertiary care hospital in Larkana, utilizing a WHO-validated self-administered questionnaire. The survey covered various aspects of IPC, including hand hygiene knowledge, attitudes towards infection control, and self-reported adherence to IPC practices. The participants included doctors, nurses, paramedics, pharmacists, and technicians, with data collected on demographic details, professional roles, and specific IPC practices.

Results: Out of 317 respondents, a substantial proportion, 65.93% (209 participants), reported routinely using alcohol-based hand rubs, indicating good practice adherence. Furthermore, 88.32% (280 participants) demonstrated sufficient knowledge on the correct handwashing technique as recommended by the WHO. Comparative analysis within the professional groups revealed that doctors and technicians were more likely to report higher adherence to hand hygiene practices than other healthcare workers.

Conclusion: The study underscores a generally high level of knowledge and adherence to hand hygiene practices among healthcare workers in the surveyed tertiary care hospital in Larkana. Despite these positive findings, the variability in self-reported practices across different professional groups suggests the need for targeted educational and policy interventions to ensure uniform IPC compliance.

Keywords: Healthcare-associated infections, Infection prevention and control, Hand hygiene, Tertiary care hospital, Healthcare workers, Cross-sectional survey.

INTRODUCTION

In the realm of global public health, healthcare-associated infections (HCAIs) represent a significant challenge, contributing substantially to the morbidity and mortality of healthcare workers and patients alike (1). Such infections not only exacerbate the burden on healthcare systems through increased antimicrobial resistance (AMR) and financial strain but also result in prolonged hospital stays for affected individuals (2). The incidence of HCAIs is notably higher in low and middle-income countries (LMICs) compared to their developed counterparts, with the World Health Organization (WHO) reporting that 7% of patients in developed countries and 15% in LMICs acquire at least one HCAI during their hospital stay (3). The lack of robust surveillance and data collection

Journal of Health and Rehabilitation Research 2791-156X JHRR

efforts, often hindered by limited resources and expertise, exacerbates the difficulty in accurately assessing the impact of HCAIs in these regions (4).

One of the primary vectors for the transmission of HCAIs is the contamination of healthcare workers' hands during patient care, compounded by the extended presence of patients' families within hospital environments (5). This situation underscores the critical importance of implementing effective infection prevention and control (IPC) measures. The WHO emphasizes adherence to its Five Moments for Hand Hygiene and other IPC strategies as essential for enhancing patient safety and reducing the risk of HCAI transmission (6). However, in many healthcare settings, especially within Pakistan, IPC measures are often neglected due to a variety of factors, including the absence of formal IPC policies, insufficient training and education, and a lack of necessary resources (7).

Research has demonstrated that IPC is a cost-effective approach capable of preventing and reducing the incidence of HCAIs by 30-70%. The emergence of global health threats, such as the severe acute respiratory syndrome (SARS) and influenza, has further highlighted the need for improving IPC practices within healthcare settings. This need has become even more urgent in the wake of the COVID-19 pandemic, prompting calls for a comprehensive overhaul of healthcare processes to include the development of core competencies among healthcare personnel through targeted training and education (8).

The current study aims to evaluate the adherence to IPC practices and the implementation of HCAI surveillance programs within a tertiary care hospital in Larkana, Sindh. Utilizing a WHO-validated, self-administered questionnaire, the study seeks to assess the current state of IPC measures across various departments of the hospital, identifying areas with room for improvement. The overarching goal is to enhance the prevention of infections among healthcare workers and patients, thereby contributing to safer hospital environments. This evaluation will not only shed light on the perception of infection control among healthcare workers but also on the practical implementation of IPC measures, offering insights into the efficacy of existing protocols and the need for further interventions to safeguard against the spread of infections within healthcare settings.

MATERIAL AND METHODS

In the methodology and research design of this study, a comprehensive approach was employed to assess infection control practices among healthcare workers at a public tertiary care hospital in Larkana, Sindh. The research employed a cross-sectional survey method, which was executed over a three-month period from December to February 2022. The primary source of data collection was utilized to align with the study's objectives, ensuring a focused and relevant accumulation of data.

The study population comprised healthcare workers from various departments within the tertiary care hospital. The selection of participants was guided by specific inclusion and exclusion criteria to maintain a focused and relevant participant group. Specifically, all healthcare workers present on duty during the data collection period were included, while those not present were excluded from the study. This approach facilitated the recruitment of participants who were directly engaged in the healthcare processes and practices under investigation (2, 9).

A purposive and convenient sampling strategy was implemented to recruit the study participants. This method allowed for the selection of individuals who met the study criteria and were readily available, thereby ensuring the efficient gathering of data while also targeting those most relevant to the study's focus on infection control practices (1, 6, 10).

The sample size was meticulously calculated using the EPI Info, a web-based calculator specifically designed for public health research. The formula X=Z^2 x S.D x (1-S.D)/(margin of error)^2 was applied, resulting in a primary figure of 384. This was further refined considering the total population of healthcare workers at the hospital, leading to a final sample size of 306 participants (4, 5, 11).

For the collection of data, a World Health Organization (WHO) validated self-administered questionnaire was utilized. The questionnaire was distributed to healthcare workers who were present during the designated OPD hours, and responses were collected the same day to ensure accuracy and immediacy of the data (8, 12, 13).

Upon the completion of data collection, the obtained information was meticulously cleared, checked, and entered into IBM's SPSS version 25.0 for analysis. This comprehensive process included both descriptive analysis, wherein mean and standard deviation were calculated for quantitative variables, and frequencies and percentages for categorical variables, presenting the results in both graphical and tabular formats for clarity and ease of interpretation.

Ethical considerations were rigorously observed throughout the research process. Approval was sought and obtained from the ethical committee of the Health Services Academy (IRB-HSA). Additionally, informed consent was secured from the hospital administration, including the Medical Superintendent, as well as from the participating healthcare workers, ensuring a transparent and ethical engagement with all stakeholders. The privacy of hospital data and the confidentiality of healthcare workers' information were stringently protected, with the assurance that data would be used solely for the purposes of this study, adhering to the principles of the Helsinki Declaration regarding ethical conduct in research involving human subjects.

Journal of Health and Rehabilitation Research 2791-156X JHRR

RESULTS

In the comprehensive cross-sectional survey conducted at a tertiary care hospital in Larkana to assess the infection control practices among healthcare workers, detailed insights were drawn from a broad spectrum of respondents, encapsulating a gender distribution where females slightly outnumbered males, making up 53.9% of the participants. This survey illustrated a significant participation from a diverse professional background, predominantly featuring doctors who represented 59.93% (190 out of 317) of the total respondents. Nurses, paramedics, pharmacists, and house officers also contributed to the survey, with paramedics being the least represented at 3.78% (12 out of 317).

Table 1: Demographic and Professional Distribution of Participants

Characteristic	Frequency	Percent (%)
Gender		
Male	146	46.1
Female	171	53.9
Total Participants	317	100.0
Ward		
Intensive Care	48	15.1
Surgery	170	53.6
Medicine	99	31.2
Profession		
Doctor	190	59.9
Dentist	34	10.7
Nurse	12	3.8
Pharmacist	10	3.2
Technician	71	22.4

The evaluation of healthcare-associated infections on patient's clinical outcomes revealed a strong consensus among doctors, with a staggering 69.47% (132 out of 190) acknowledging a high impact, and house officers echoing this sentiment, where 61.97% (44 out of 71) aligned with the high impact perception. Such responses underscore the critical awareness of healthcare-associated infections' consequences within the hospital's staff.

Table 2: Infection Control Awareness and Practices

Question	Yes	Percent (%)	No	Percent (%)	Total
Know the six-step hand washing technique?	280	88.3	37	11.7	317
Believe the hospital has good infection control management?	176	55.5	141	44.5	317
Received formal training in hand hygiene in the last three years?	169	53.3	148	46.7	317
Routinely use an alcohol-based hand rub for hand hygiene?	209	65.9	108	34.1	317

Hand hygiene practices, a pivotal element of infection prevention, were reported to be adhered to by a majority of healthcare workers. Specifically, 70.53% (134 out of 190) of doctors and 49.30% (35 out of 71) of technicians indicated that more than 60% of their colleagues maintained hand hygiene, either through hand washing or hand rubbing. Conversely, a contrasting view emerged from a portion of the respondents, where 56 doctors and 21 technicians believed that less than 50% of healthcare workers complied with hand hygiene standards.

Journal of Health and Rehabilitation Research JHRR

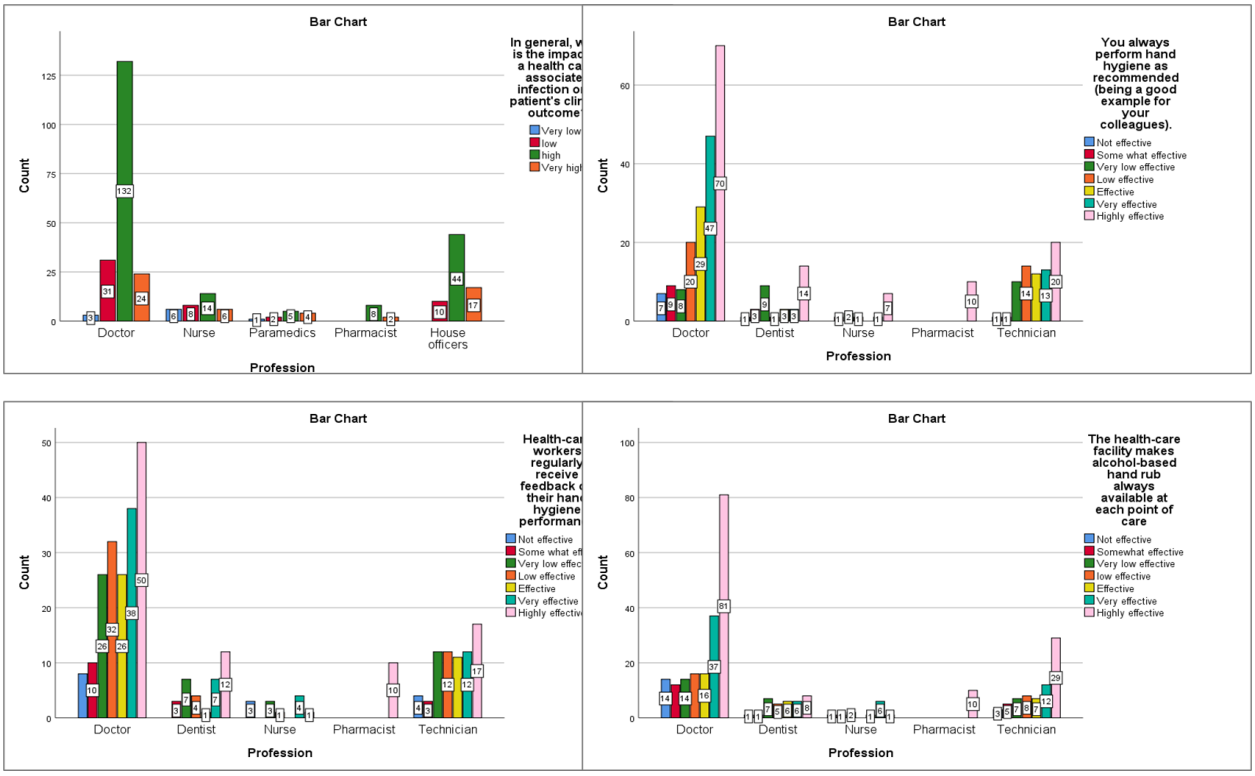

Figure 1 impact of HCAI on Patient Outcomes and Hand Hygiene Practices: Assessing Performance, Alcohol-Based Rub Availability, and HCW Education

The effectiveness of hand hygiene education was overwhelmingly recognized, with 100% (10 out of 10) of pharmacists deeming it highly effective. This indicates a robust educational framework in place, albeit with a noted disparity among technicians, suggesting a potential need for more targeted educational efforts to cater to specific professional nuances.

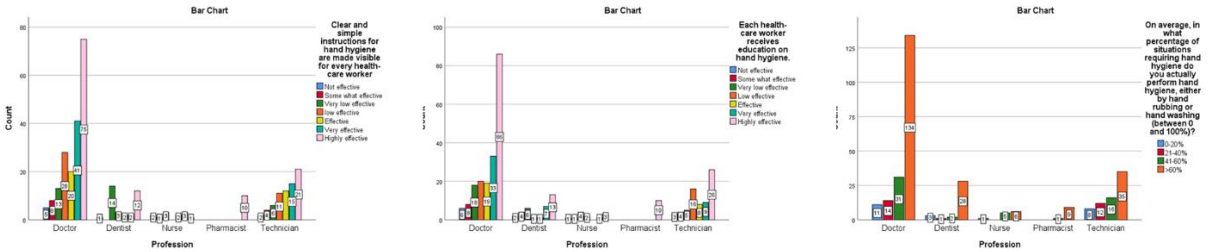

Figure 2 Hand Hygiene Practices: Instructions, Feedback, and Recommendations by Healthcare Workers

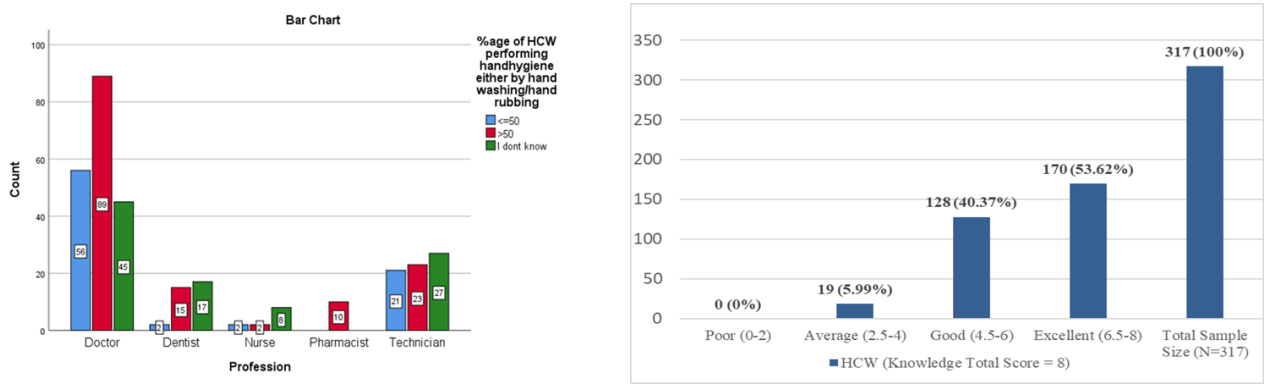

Figure 3 Hand Hygiene Performance and Knowledge Scores Among Healthcare Workers

Furthermore, the presence of clear and simple instructions for hand hygiene was largely deemed highly effective by 75 doctors, reflecting the critical role of straightforward and accessible hygiene protocols. However, this viewpoint was not uniformly held across

Journal of Health and Rehabilitation Research 2791-156X JHRR

all professions, as evidenced by dentists, among whom 12 found these instructions highly effective while 14 regarded them as very low effective.

Table 8: Support and Promotion of Hand Hygiene by Leaders and Senior Managers

Response Category	Frequency	Percent (%)	Cumulative Percent (%)
Not effective	9	2.8	2.8
Somewhat effective	18	5.7	8.5
Very low effective	27	8.5	17.0
Low effective	36	11.4	28.4
Effective	54	17.0	45.4
Very effective	57	18.0	63.4
Highly effective	116	36.6	100.0
Total	317	100	

Regular feedback on hand hygiene performance was also highlighted as a significant factor, with 50 doctors considering it highly effective. This emphasizes the importance of ongoing evaluation and feedback mechanisms in sustaining high hand hygiene compliance rates.

Leadership's role in promoting hand hygiene was notably appreciated, with 36.6% (116 out of 317) of the total participants acknowledging it as highly effective. This underscores the influential role of senior management in fostering a culture of safety and diligence towards infection control measures within the hospital setting.

Collectively, the survey results offer a nuanced understanding of the current state of infection control practices at the tertiary care hospital, highlighting areas of strength such as the recognition of hand hygiene's importance and the effectiveness of educational interventions. It also identifies areas for improvement, particularly in enhancing hand hygiene compliance and ensuring the uniform effectiveness of hygiene protocols across all professional groups. These insights serve as a valuable foundation for reinforcing existing strategies and addressing gaps to elevate the standard of infection control practices within the institution.

DISCUSSION

In the survey conducted at a tertiary care hospital in Larkana, an assessment of healthcare workers' knowledge, preventive attitudes, and self-reported practices concerning infection control was undertaken, providing insightful revelations into the state of hand hygiene and infection prevention. A notable finding from this study was that a significant majority, 209 (65.93%) of the respondents, routinely utilized alcohol-based hand rubs, indicative of a commendable level of adherence to hand hygiene practices. Furthermore, an overwhelming 280 (88.32%) of participants demonstrated an adequate understanding of the World Health Organization's six-step handwashing technique, underscoring a strong foundational knowledge of essential infection control measures (3, 7, 14).

Comparatively, a study conducted in Tanzania highlighted contrasting compliance rates across various infection control practices, with notably low adherence to hand hygiene at 6.9%, suggesting a global inconsistency in the implementation of such practices. This inconsistency is further illustrated by the World Health Organization's global situational analysis, which revealed that while 67.0% of countries had national guidelines for infection prevention and control, only a fraction had policies in place for their implementation (36.4%) and compliance monitoring (21.6%). This disparity underscores a critical need for enhanced policy enforcement and compliance monitoring to ensure effective infection control measures are universally adopted and practiced (3, 15, 16).

Further complicating the landscape of infection control, a national survey in the United States uncovered that 54% of healthcare workers juggled additional tasks alongside infection control, with 61% lacking specialized training in infection prevention and control (IPC). This was coupled with reports of deficient infection control practices in 36% of the participating facilities, highlighting a pressing need for dedicated IPC training and resources to bolster infection control efforts (17-19).

In a parallel vein, research conducted in Iran identified five key challenges hindering the effective prevention and control of healthcare-associated infections, including inadequate resources, limited monitoring and surveillance, a deficient safety culture, governance issues, and inappropriate antibiotic prescribing practices. Similarly, a study emphasized the absence of designated IPC focal persons in nearly half of the health facilities surveyed, alongside shortcomings in patient bed allocation, inter-bed spacing, and availability of essential hand hygiene facilities, revealing critical gaps in the basic infrastructure required for effective infection prevention (20, 21).

Reflecting on these findings, it is evident that knowledge and practice of hand hygiene and infection control among healthcare workers in Larkana are commendably high. However, comparisons with global studies expose significant disparities in infection

Journal of Health and Rehabilitation Research 2791-156X JHRR

control practices, highlighting the necessity for targeted interventions to address these inconsistencies. Recommendations for the administration include initiating measures to enhance healthcare workers' knowledge and understanding of preventive approaches through educational programs and ensuring the availability of essential equipment for implementing IPC measures in health facilities (3, 21).

The strengths of the current study lie in its methodological approach, employing a validated self-administered questionnaire to collect data from healthcare professionals, providing a reliable snapshot of infection control practices within the hospital. However, the study is not without its limitations, constrained by financial and temporal resources, and lacks comparative data from other hospitals in different cities, which could offer a broader perspective on infection control practices across various healthcare settings.

CONCLUSION

In conclusion, while the study presents a positive outlook on hand hygiene and infection control practices among healthcare workers in Larkana, it also underscores the critical need for global improvements in IPC policy implementation, compliance monitoring, and infrastructure development. These efforts are essential to achieving a standardized and effective approach to infection prevention and control worldwide.

REFERENCES

1. Bunduki GK, Masoamphambe E, Fox T, Musaya J, Musicha P, Feasey N. Prevalence, risk factors, and antimicrobial resistance of endemic healthcare-associated infections in Africa: a systematic review and meta-analysis. BMC Infectious Diseases. 2024;24(1):1-18.

2. Asghar A, Khalid A, Baqar Z, Hussain N, Saleem MZ, Rizwan K. An insights into emerging trends to control the threats of antimicrobial resistance (AMR): an address to public health risks. Archives of Microbiology. 2024;206(2):1-18.

3. Latif A, Ali W, Haleem S, Mahmood F, Munir T, Virani N, et al. Implementation and Long-term Efficacy of a Multifaceted Intervention to Reduce Central Line-Associated Bloodstream Infections in Intensive Care Units of a Low Middle-Income Country. American Journal of Infection Control. 2024.

4. Ciccacci F, De Santo C, Mosconi C, Orlando S, Carestia M, Guarenti L, et al. Not only COVID-19: a systematic review of anti-COVID-19 measures and their effect on health care-associated infections. Journal of Hospital Infection. 2024.

5. Centeleghe I, Norville P, Maillard J-Y, Hughes L. Infection prevention control in practice: a survey of healthcare professionals' knowledge and experiences. Infection Prevention in Practice. 2024:100357.

6. Bridgen JR, Lewis JM, Todd S, Taegtmeyer M, Read JM, Jewell CP. A Bayesian approach to identifying the role of hospital structure and staff interactions in nosocomial transmission of SARS-CoV-2. Journal of the Royal Society Interface. 2024;21(212):20230525.

7. Kelly SA, O'Connell NH, Thompson TP, Dillon L, Wu J, Creevey C, et al. A novel characterised multidrug-resistant Pseudocitrobacter isolated from a patient colonised while admitted to a tertiary teaching hospital. Journal of Hospital Infection. 2024.

8. Frenk J, Chen LC, Chandran L, Groff EO, King R, Meleis A, et al. Challenges and opportunities for educating health professionals after the COVID-19 pandemic. The Lancet. 2022;400(10362):1539-56.

9. Baqar M, Kumar R, Khushk IA, Noonari AA, Ahmed F. Hospital Infection Control Practices among Nursing Staff Working at Tertiary Care Hospital of Khairpur, Sindh. Journal of Liaquat University of Medical & Health Sciences. 2018;17(02):117-22.

10. Carrico RM, Rebmann T, English JF, Mackey J, Cronin SN. Infection prevention and control competencies for hospital-based health care personnel. American journal of infection control. 2008;36(10):691-701.

11. Esfandiari A, Rashidian A, Asl HM, Foroushani AR, Salari H, Sari AA. Prevention and control of health care–associated infections in Iran: A qualitative study to explore challenges and barriers. American journal of infection control. 2016;44(10):1149-53.

12. Herzig CT, Stone PW, Castle N, Pogorzelska-Maziarz M, Larson EL, Dick AW. Infection prevention and control programs in US nursing homes: results of a national survey. Journal of the American Medical Directors Association. 2016;17(1):85-8.

13. Islam MS, Rahman KM, Sun Y, Qureshi MO, Abdi I, Chughtai AA, et al. Current knowledge of COVID-19 and infection prevention and control strategies in healthcare settings: A global analysis. Infection Control & Hospital Epidemiology. 2020;41(10):1196-206.

14. Wiharto M, Sumartono S, Maratis J. Efforts to Maintain Health by Implementing Six Step Handwashing for Middle School Students. Jurnal Penelitian Pendidikan IPA. 2023;9(5):2573-9.

15. Moro M, Marchi M, Buttazzi R, Nascetti S, group I-Op. Progress in infection prevention and control in Italy: a nationwide survey. Journal of Hospital Infection. 2011;77(1):52-7.

Journal of Health and Rehabilitation Research 2791-156X JHRR

16. Park JY, Pardosi JF, Seale H. Examining the inclusion of patients and their family members in infection prevention and control policies and guidelines across Bangladesh, Indonesia, and South Korea. American journal of infection control. 2020;48(6):599-608.

17. Powell-Jackson T, King JJ, Makungu C, Spieker N, Woodd S, Risha P, et al. Infection prevention and control compliance in Tanzanian outpatient facilities: a cross-sectional study with implications for the control of COVID-19. The Lancet Global Health. 2020;8(6):e780-e9.

18. Qirjako G, Qosja A, Draçini X, Çomo N, Hyska J, Fico A, et al. Infection prevention and control in healthcare facilities in Albania. South Eastern European Journal of Public Health (SEEJPH). 2022.

19. Savul S, Lalani FK, Ikram A, Khan MA, Khan MA, Ansari J. Infection prevention and control situation in public hospitals of Islamabad. The Journal of Infection in Developing Countries. 2020;14(09):1040-6.

20. Tartari E, Tomczyk S, Pires D, Zayed B, Rehse AC, Kariyo P, et al. Implementation of the infection prevention and control core components at the national level: a global situational analysis. Journal of Hospital Infection. 2021;108:94-103.

21. Wang Q, Wang X, Lin H. The role of triage in the prevention and control of COVID-19. Infection Control & Hospital Epidemiology. 2020;41(7):772-6.