

Article

# THE EFFECT OF PEER COACHING WITH VISUAL DISPLAYS ON NURSES HAND WASHING COMPLIANCE AT MOTHER AND CHILD HOSPITAL IN BANDUNG CITY



Riska Puspitasari<sup>1</sup>, Eva Supriatin, S.Kp., M.Kep., PhD<sup>2</sup>

<sup>1</sup>STIKep PPNI West Java, Indonesia

<sup>2</sup>STIKep PPNI West Java, Indonesia

\* Correspondence: [188riaoktaviani@gmail.com](mailto:188riaoktaviani@gmail.com), [2dwee96tania@gmail.com](mailto:2dwee96tania@gmail.com)

Academic Editor: Taryudi

Received: Dec 26, 2025

Revised: Jan 12, 2026

Accepted: Jan 15, 2026

Published: Feb 28, 2026

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Website

<https://journal.img.co.id/index.php/ijaph>



## Abstract

**Background:** Handwashing compliance is a crucial indicator in preventing nosocomial infections in hospitals. The combination of peer coaching and visual displays is considered to provide direct feedback and effective visual reinforcement in establishing consistent handwashing habits

**Objective:** To determine the effect of peer coaching with visual displays on handwashing compliance among nurses at the Mother and Child Hospital in Bandung.

**Methods:** This study used a pre-experimental design with a pre-test – post-test one group design approach on 45 nurses in four service units with low compliance levels. The intervention was carried out for four weeks by IPCLN using visual display media in the form of a scoreboard, Wall of Fame, appreciative posters, and weekly visual targets (mild gamification). Data were collected using the WHO observation form and analyzed using the Wilcoxon test.

**Results:** There was an increase in handwashing compliance across all units after the intervention, with an increase of 50-75%. The Wilcoxon test result showed a significant difference between before and after the intervention ( $p = 0.000$ ).

**Conclusion:** Peer coaching with visual displays has been shown to have an effect on increasing nurses' handwashing compliance. These interventions not only have short-term impacts, but also support the formation of a sustainable patient safety culture in the hospital environment.

**Keywords:** peer coaching, visual display, handwashing compliance, nurses, multimodal strategies

## INTRODUCTION

Healthcare workers are one of the primary sources of infection transmission in healthcare facilities. Infection transmission can occur in various ways, including hand-to-hand contact. Healthcare workers' hands contaminated with microorganisms from patients, medical equipment, and the patient's environment can act as a potential route for infection transmission, especially if they fail to wash their hands (Ridha, 2025).

Nosocomial infections, or infections acquired in healthcare facilities, are a significant global health problem. According to the World Health Organization (WHO), approximately 7 in 100 patients in low- and middle-income countries experience nosocomial infections, with inadequate handwashing being a major cause. The WHO has established "5 Moments for Handwashing" guidelines that must be followed by all healthcare workers, especially nurses who have high levels of direct patient contact.

Handwashing is the act or activity of cleaning hands using soap and running water or using an alcohol-based hand sanitizer with the aim of preventing microorganisms from growing on the hands (WHO, 2009). According to the Center for

Disease Control and Prevention (2024), handwashing is the process of cleaning hands to prevent the spread of infectious diseases, which is carried out using soap and water or using an alcohol-based hand sanitizer. Regulation of the Minister of Health of the Republic of Indonesia No. 27 of 2017 concerning Infection Prevention and Control in Healthcare Facilities, Article 3 states that infection prevention and control are implemented through the application of standard precautions, one of which is hand hygiene. Furthermore, it states that healthcare facilities must conduct surveillance for infection prevention and control.

However, several studies show that nurses' compliance with hand hygiene practices is far from ideal. Factors such as high workloads, lack of supervision, and a weak safety culture are often key barriers. Conventional approaches like formal training and displaying educational posters are often insufficient to generate sustainable behavior change.

Various approaches have been implemented to improve compliance. One innovative approach that is gaining traction is peer coaching, which involves direct, contextual learning and support between colleagues in the workplace. By involving nurses as partners in providing feedback and motivation, this approach is believed to be more effective in internalizing positive behaviors, including handwashing compliance.

A study showed that implementing direct feedback through a web-based application can improve safety culture in a hospital environment and positively change handwashing behavior of healthcare workers over a three-year period (Sickbert-Bennett EE, et al., 2019). Another study conducted in a medical intensive care unit using an automated sensor system found that the presence and proximity of colleagues can increase handwashing compliance rates. Compliance rates increased from 20.85% to 27.9% when healthcare workers were near colleagues, suggesting that social interaction can influence handwashing behavior (Sullivan, 2014 in Fierce Healthcare 2019).

In Indonesia, a study at the Klungkung Regency General Hospital showed that implementing nursing coaching improved nurses' adherence to the "5 Moments, 6 Steps" handwashing principle. However, the level of compliance achieved was still below minimum service standards, requiring further efforts to maintain and improve compliance (Yanti Dewi et al., 2018).

Poor handwashing compliance not only increases the risk of cross-infection between patients but also increases healthcare costs. Peer coaching, as a method of peer development, offers a participatory and supportive approach and has been proven effective in improving compliance in various clinical contexts.

Although several international studies have demonstrated the effectiveness of peer coaching in improving healthcare workers' handwashing compliance, empirical data in Indonesia remains limited, particularly those focused on nurses in hospital settings. Most interventions in Indonesian hospitals still focus on formal training and authoritative supervision. However, peer-based approaches have the potential to be more effective due to their collaborative, non-judgmental nature and the ability to be implemented sustainably in the field.

Therefore, this study developed a peer coaching strategy using visual displays. Visual displays are visual media used to convey information or messages directly, quickly, and easily understood. In the context of handwashing compliance in a hospital environment, visual displays can include educational posters, infographics, diagrams of handwashing steps, indicator lights, and compliance scoreboards. These media serve not only as reminders but also as effective motivational tools.

Studies show that strategic use of visual displays can strengthen healthcare workers' awareness and personal responsibility for handwashing practices. For example, placing posters or digital displays in strategic areas like treatment room entrances, handwashing areas, or nurses' stations can serve as an immediate trigger for practicing handwashing according to protocol.

Additionally, visual displays that show real-time compliance data, such as dashboard displays or team scoreboards, can foster both intrinsic and extrinsic motivation. When nurses see improvements in compliance rates or their team's ranking, a sense of pride, responsibility, and healthy competition emerge, contributing to increased consistent handwashing behavior (Sickbert-Bennett et al., 2016). Visual displays designed not only as a reminder, but also as a form of positive reinforcement that functions like a reward to motivate nurses to increase compliance with handwashing practices. The visual displays used include 1) Team Compliance Scoreboard, 2) The Best Team Wall of Fame, 3) Illustrated & Interactive Appreciative Poster, 4) Weekly Visual Targets (Light Gamification).

The Infection Prevention and Control (IPC) Team at Women and Children's Hospital assessed nurses' handwashing compliance through a multimodal strategy evaluation. This strategy consists of five main components: System Change, Training and Education, Workplace Reminders, Observation and Feedback, Environmental Support, and Patient Safety Culture. The evaluation, based on this multimodal strategy, found low scores for the observation and feedback components.

Data on handwashing compliance among nurses at the Mother and Child Hospital for the past 6 months, namely October-December 2024 and January- March 2025, shows that the handwashing compliance rate for each month has

reached the national target of 85%. However, upon further analysis, several service units were found to have low levels of handwashing compliance, even those that did not reach the specified target or standard. This condition is a serious concern because non-compliance in just one unit can increase the risk of spreading nosocomial infections, considering that services in the hospital are interconnected between units.

Researchers are interested in using a combination of peer coaching and visual displays to synergistically fulfill the role of observation and feedback within the WHO multimodal strategy. Peer coaching provides real-time, constructive interpersonal feedback, while visual displays provide collective, ongoing visual feedback. Both not only support individual behavior change but also foster a consistent safety culture within the healthcare workforce.

## METHODE

The research design was pre-experimental with a one-group pre-test-post-test approach. The sample size was 45 nurses from four service units. The sampling technique used was purposive sampling. The intervention was carried out by four coaches from the IPCLN (National Health and Social Service Institute). The visual media used included a scoreboard, weekly gamification, motivational posters and videos, and a wall of fame.

Data were collected using the WHO observation sheet (5 Moments and 6 Steps of Handwashing). Data analysis used the Wilcoxon Signed Rank Test with a significance level of 0.05.

## RESULTS

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which means that there is a statistically significant difference between the level of handwashing compliance of nurses before and after peer coaching with visual displays.

Furthermore, the results show that out of 45 respondents, there were 26 positive ranks, meaning that their handwashing compliance score increased after the intervention, 2 negative ranks, meaning that their handwashing compliance score decreased after the intervention, while 17 respondents had ties (11 respondents remained compliant and 6 respondents remained non-compliant), meaning that their compliance score before and after the intervention did not change.

Positive rank which is much higher than the negative rank indicates that most respondents experienced increased compliance after the intervention. These results indicate that the peer coaching intervention with visual displays has a significant influence on increasing handwashing compliance among nurses at the Mother and Children's Hospital.

## DISCUSSION

This study aims to determine the effect of peer coaching combined with visual displays on nurses handwashing compliance. This intervention was carried out by four coaches who are PK 3 nurses who have been Infection Prevention Control Link Nurses (IPCLN) for five years, and have participated in Basic Infection Prevention and Control training, thus having the competence and experience in fostering infection prevention practices, including the implementation of handwashing compliance. This study was conducted in four service units that have low levels of handwashing compliance, namely 3 Maternal and Child Inpatient Units (Ranap Buildings A, 3C and 4B) and the Emergency Department (IGD). These four units have different service characteristics, but are areas with a high risk of nosocomial infections. The Maternal and Child Inpatient Unit is an area where nurses provide nursing care to women in labor, children, sick mothers, and post-operative patients.

The intense nurse-patient interaction, coupled with the high frequency of nursing procedures such as vital sign checks, wound care, medication administration, and education, make adherence to hand hygiene crucial for preventing cross-infection.

Meanwhile, the Emergency Department (ER) is a unit with a high level of urgency and frequent, rapidly changing patient contact. Nurses in the ER must be able to make decisions and take action quickly, often moving from one patient to another quickly. In these conditions, adherence to hand hygiene is often neglected due to time pressures and multitasking. Based on the analysis, it was found that the handwashing compliance rate of nurses in the four service units before the intervention was below the national standard of 85%. This indicates that nurses' handwashing compliance practices in the field are still suboptimal, despite education and training on the importance of hand hygiene. This fact is reinforced by the results of a previous assessment of the implementation of the multimodal strategy, which found that the observation and feedback components were not optimally implemented.

Furthermore, from the perspective of Social Cognitive Theory (SCT) developed by Bandura, behavior is shaped by the reciprocal relationship between individual factors, behavior, and the social environment. A lack of observation and

feedback from supervisors or peers results in a lack of external reinforcement needed to establish and maintain good handwashing behavior.

After the peer coaching intervention with visual displays and evaluation at the end of the fourth week, all service units experienced a significant increase in handwashing compliance. Unit 3C increased to 100%, 4B to 85%, building A to 86% and the Emergency Room to 90%. The increase in handwashing compliance across all service units after this intervention indicates that the combined approach of peer coaching and visual displays has proven effective in modifying the behavior of healthcare workers, especially nurses. Evidenced by the results of the Wilcoxon Signed Rank Test showing a significance value of 0.000 ( $p < 0.005$ ), which means there is a significant difference between pre- test and post-test compliance.

However, the Wilcoxon test results also showed a negative rank in two respondents, indicating that handwashing compliance levels in the post-test actually decreased compared to the pre-test. One factor that may explain this is the coach selection mechanism. In this study, the IPCN appointed IPCLN in their respective units as coaches, but this appointment was made top-down without a participatory selection process by the team in that unit. This condition can affect team members' acceptance of the coaching process. According to peer coaching theory, the effectiveness of peer mentoring is influenced by mutual trust and good interpersonal relationships. Coaches who are not selected collaboratively are at risk of facing passive resistance, less open communication, and limited internal motivation among the coaching recipients. This can cause positive behaviors formed during the pre-test to be unmaintained and even decline during the post-test. The effectiveness of this intervention can also be analyzed using the Transtheoretical Model of Behavior Change. This model explains that behavioral change does not occur suddenly, but rather through five stages : precontemplation, contemplation, preparation, action, and maintenance. Before the intervention, some nurses may have been in the precontemplation stage, where they were not yet fully aware of the importance of hand hygiene. Through peer coaching, nurses began to enter the contemplation and preparation stages, as they received direct feedback from colleagues regarding their behavior. The visual displays served as reminders and reinforcements that encouraged them to move into the action stage. When compliance continued to increase each week, this indicated that nurses were moving into the maintenance stage. This means that the behavioral changes that occurred were not just temporary but had the potential to become permanent habits if the intervention was continued and consistently reinforced. This confirms that the intervention not only impacted short- term results but also encouraged the internalization of new values and habits.

These results align with research by Yanti Dewi et al. (2017) conducted at Klungkung Regional Hospital, Bali. The study found that providing nursing coaching significantly improved nurses' handwashing compliance from "adequate" to "good." One crucial aspect of the success of this intervention is the use of visual displays as a medium for education and behavioral reinforcement. Visual displays can improve compliance because they work through several psychological mechanisms. First, visual cues serve as external stimuli that encourage automatic responses without the need for further thought, making them effective in busy situations such as the emergency room. Second, visual media capture attention better than traditional verbal or written messages because they utilize strong elements of color, design, and symbolism. Third, visual displays support positive reinforcement, particularly when showcasing awards such as a "Wall of Fame" or a chart of unit achievements. This fosters a sense of pride, social responsibility, and healthy competition among nurses. Furthermore, openly displaying compliance data also fosters a culture of transparency and accountability in the workplace.

This is in line with the research findings of Sickbert-Bennett et al. (2019) in the article "The Holy Grail of Hand Hygiene Compliance," which showed that a technology-based just-in-time peer coaching intervention significantly increased handwashing compliance. Peer feedback, such as praise or reinforcement, has been shown to encourage behavioral change.

Similarly, research by Nevo et al. (2010) evaluated various types of visual cues in a hospital environment. In their study, the installation of a warning sign reading "Warning! This Room is Under Electronic Surveillance..." was shown to increase handwashing compliance by up to 93.3%. This increase occurred because the sign combined visual aspects (large and conspicuous) with psychological aspects (surveillance).

Thus, it can be concluded that peer coaching interventions using visual displays have a significant impact on improving nurses' handwashing compliance. Peer coaching provides nurses with the opportunity to provide direct feedback to each other. Meanwhile, visual displays such as scoreboards, walls offame, and appreciation posters serve as reminders and motivational boosters. The success of the intervention in 4 service units at this Mother and Child Hospital shows that the approach taken can be adapted and replicated in other units with similar conditions.

## CONCLUSION

Based on the results of research conducted on 45 nurses at the Mother and Child Hospital, the following conclusions can be drawn:

1. The level of handwashing compliance of nurses before the peer coaching intervention with visual displays was still

- below the national standard (85%) in all units studied, with average compliance ranging from 20% to 36%.
2. After being given intervention and observation for 4 weeks, there was a significant increase in the level of handwashing compliance in all units, with an average post-test achievement of  $\geq 85\%$ . This indicates that the intervention had a positive impact on changing nurses' handwashing behavior.
  3. The results of the Wilcoxon Signed Rank Test showed that there was a significant difference ( $p=0.000$ ) between compliance before and after the intervention, so it can be concluded that peer coaching with visual displays had a significant effect on increasing nurses' handwashing compliance.
  4. This intervention supports the WHO multimodal strategy, particularly in the aspects of observation, feedback, and reminders in the workplace, and can be an effective and applicable educational method in shaping a patient safety culture in hospitals.

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