

The Impact of Hand Hygiene Standard Operating Procedure (SOP) Implementation by Healthcare and Support Personnel on the Patient Safety Culture at Nala Husada Dental Hospital

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Abstract

Background: Healthcare-associated infections (HAIs) are infections that often occur in healthcare facilities, particularly in hospitals. Prevention of HAIs is a significant component in patient safety efforts. One practical step to prevent HAIs is through the implementation of decent hand hygiene by Standard Operating Procedures (SOPs). Therefore, the implementation of SOPs for hand hygiene is crucial for all components of the hospital, including health workers and supporting staff. The implementation of good SOPs for hand hygiene will create a good patient safety habit.

Purpose: This study aims to determine the effect of implementing SOPs for hand hygiene among health workers and supporting staff on patient safety habits at Nala Husada Dental Hospital.

Methods: This study employs an observational analytical research design. This study was conducted through direct observation and the distribution of questionnaires. From the results of observations and questionnaires, data will be obtained that can be used to determine the effect of implementing SOP hand hygiene on the health and safety habits of health workers and support staff, as well as their impact on patient safety, at Nala Husada Dental Hospital.

Results: The Spearman correlation test results for the variable implementation of SOP hand hygiene and the variable of patient safety habit yielded a Significant P-value. (2-tailed) value of 0.007, which is less than 0.05. Conclusion: Implementing good hand hygiene SOPs plays a role in improving patient safety culture.

Keywords: Patient Safety Habit; Hand Hygiene SOP; Health Workers; Support Staff

1. Introduction

A dental hospital is a healthcare facility that provides oral and dental treatment services. It also aims to restore patients' oral health while prioritizing patient satisfaction and safety.¹ Patient safety is a top priority in healthcare services, particularly when involving high-risk procedures.² One of the main risks is Healthcare-Associated Infections (HAIs), infections acquired during medical treatment in a healthcare facility.³ These infections can be transmitted between patients, healthcare professionals, and even visitors through various mechanisms.⁴

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Proper hand hygiene is crucial in preventing healthcare-associated infections (HAIs). Hospital personnel include healthcare professionals and supporting staff.⁶ Although supporting staff may not engage in direct patient care, their daily interactions within the hospital environment still pose a risk of acquiring and spreading infections.⁷

For healthcare professionals, maintaining hand hygiene is critical in reducing the spread of harmful microorganisms and lowering the risk of HAIs.⁸ Standard Operating Procedures (SOPs) play a key role in managing patient safety.⁹ Full support and compliance with SOPs are crucial in efforts to enhance a culture of safety.¹⁰

Hand hygiene is considered one of the core quality indicators in patient safety targets.¹¹ Adherence to hand hygiene protocols enhances the development of a safety culture within healthcare institutions.¹² When implemented consistently, such practices contribute to establishing a strong patient safety culture, which ultimately improves the quality of care. Therefore, implementing hand hygiene SOPs is a strategic step in supporting safe practices and patient-centered policies.¹³

2. Methods

This study employed an analytical observational design using a cross-sectional approach. The target population included all active healthcare workers and support staff at Nala Husada Dental Hospital. A total of 31 participants were selected through cluster random sampling, comprising 16 support staff and 15 healthcare professionals. Inclusion criteria were:

- Healthcare workers and support staff who are still active at Nala Husada Dental Hospital
- Healthcare workers and support staff at Nala Husada Dental Hospital who are willing to be observed during the study
- Healthcare workers and support staff at Nala Husada Dental Hospital who are willing to participate in the study by completing an online questionnaire until completion

2.1. Communicative and able to work cooperatively

The implementation of hand hygiene SOPs was assessed through both direct observation using a structured checklist and a self-administered questionnaire. Patient safety culture was evaluated using a validated survey instrument encompassing six dimensions: values, attitudes, competencies, commitment, perceptions, and facilities.

Descriptive (univariate) analyses were conducted to classify implementation levels and patient safety culture dimensions into four categories: very poor, poor, good, and very good. Subsequently, bivariate analysis using the Spearman correlation test ($\alpha = 0.05$) was performed to determine the strength and significance of the relationship between hand hygiene SOP adherence and patient safety culture indicators. Statistical analysis was conducted using IBM SPSS software.

3. Results

The results of the univariate analysis on the implementation of hand hygiene SOPs—derived from both observational data and questionnaire responses—indicate a high level of compliance among both healthcare workers and support staff at Nala Husada Dental Hospital.

Table 1 Implementation of Hand Hygiene SOP (Observation) among Health Workers at Nala Husada Dental Hospital

Health Workers					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poor	0	0	0	0
	Poor	0	0	0	0
	Good	0	0	0	0
	Very Good	15	100.0	100.0	100.0

Table 1 shows that all healthcare workers (100%) demonstrated 'very good' adherence to hand hygiene SOPs.

Table 2 Implementation of Hand Hygiene SOP (Observation) among Support Staff at Nala Husada Dental Hospital

Support Staff					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	1	6.2	6.2	6.2
	Good	5	31.3	31.3	37.5
	Very good	10	62.5	62.5	100.0
	Total	16	100.0	100.0	

Table 2 shows that among support staff, 62.5% were categorized as 'very good', 31.3% as 'good', and 6.2% as 'poor'.

Table 3 Implementation of SOP Hand Hygiene (Questionnaire) among Health Workers at Nala Husada Dental Hospital

Health Workers					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	7	46.7	46.7	46.7
	Very good	8	53.3	53.3	100.0
	Total	15	100.0	100.0	

Table 3 shows that 53.3% of healthcare workers rated their adherence as 'very good', and 46.7% as 'good'.

Table 4 Implementation of Hand Hygiene SOP (Questionnaire) among Support Staff at Nala Husada Dental Hospital

Support Staff					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	8	50.0	50.0	50.0
	Very good	8	50.0	50.0	100.0
	Total	16	100.0	100.0	

Table 4 shows that among support staff, 50% rated themselves as 'very good' and 50% as 'good'.

Table 5 Patient Safety Culture

Patient Safety Culture					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	8	50.0	50.0	50.0
	Very good	8	50.0	50.0	100.0
	Total	16	100.0	100.0	

Table 5 shows that the general perception of patient safety culture was rated as 'very good' by 64.5% of respondents and 'good' by 35.5%

Table 6 Attitude Indicators

Attitude					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	12	38.7	38.7	38.7
	Very good	19	61.3	50.0	100.0
	Total	31	100.0	100.0	

Table 6 shows that in terms of attitude indicators, the majority of respondents showed 'very good' results, with 19 people (61.3%) and 12 people (38.7%) showing 'good' results.

Table 7 Commitment Indicators

Commitment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	12	38.7	38.7	38.7
	Very good	19	61.3	61.3	100.0
	Total	31	100.0	100.0	

Table 7 shows that, in terms of commitment indicators, the majority of respondents achieved 'very good' results, with 19 respondents (61.3%), and 'good' results, with 12 respondents (38.7%).

Table 8 Competency Indicators

Competency					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	13	41.9	41.9	41.9
	Very good	18	58.1	58.1	100.0
	total	31	100.0	100.0	

Table 8 shows that in the competency indicator, the majority of respondents showed 'very good' results with 18 people (58.1%) and 'good' results with 13 people (41.9%).

Table 9 Facilities Indicators

Facilities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	1	3.2	3.2	3.2
	Poor	3	9.7	9.7	12.9
	Good	11	35.5	35.5	48.4
	Very good	16	51.6	51.6	100.0
	total	31	100.0	100.0	

Table 9 shows that, in terms of the facilities indicator, the majority of respondents achieved 'very good' results, with 16 people (51.6%), 'good' results with 11 people (35.5%), and 'poor' results with 1 person (3.2%).

Table 10 Perception Indicators

Perception					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	9	29.0	29.0	29.0
	Very good	22	71.0	71.0	100.0
	total	31	100.0	100.0	

Table 10 shows that, in the perception indicator, the majority of respondents showed 'very good' results, with 22 respondents (71%), and 'good' results, with 9 respondents (29%).

Table 11 shows that the majority of respondents showed 'very good' assessment results in the value indicator, with 20 respondents (64.5%), and 'good' results, with 11 respondents (35.5%).

After conducting univariate analysis, bivariate analysis was performed to examine the effect of implementing hand hygiene SOPs on the overall patient safety culture and each patient safety culture indicator among healthcare workers and support staff.

Table 11 Value Indicators

Value					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	0	0	0	0
	Poor	0	0	0	0
	Good	11	35.5	35.5	35.5
	Very good	20	64.5	64.5	100.0
	total	31	100.0	100.0	

Table 12 Results of Spearman's Correlation Test on the Effect of Hand Hygiene SOP Implementation on Patient Safety Culture.

Correlations				
			Implementation of Hand Hygiene SOP	Patient Safety Culture
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.472**
		Sig. (2-tailed)	.	0.007
		N	31	31
	Patient Safety Culture	Correlation Coefficient	0.472**	1.000
		Sig. (2-tailed)	0.007	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is < 0.05, specifically 0.007, indicating that the implementation of hand hygiene SOPs among healthcare workers and support staff has an effect on patient safety culture at Nala Husada Dental Hospital. The correlation coefficient is 0.472, indicating that the strength of the relationship between the implementation of SOPs and patient safety culture is moderate.

Table 13 Results of Spearman's Correlation Test on the Effect of Hand Hygiene SOP Implementation on Attitude Indicators.

Correlations				
			Implementation of Hand Hygiene SOP	attitude
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.632**
		Sig. (2-tailed)	.	0.000
		N	31	31
	attitude	Correlation Coefficient	0.632**	1.000
		Sig. (2-tailed)	0.000	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is < 0.05 , which is 0.000, so it can be concluded that the implementation of hand hygiene SOPs among healthcare workers and support staff influences attitude indicators. The correlation coefficient obtained is 0.632, indicating a strong relationship between the variables.

Table 14 Results of Spearman's Correlation Test on the Effect of Hand Hygiene SOP Implementation on Commitment Indicators

Correlations				
			Implementation of Hand Hygiene SOP	commitment
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.437*
		Sig. (2-tailed)	.	0.014
		N	31	31
	commitment	Correlation Coefficient	0.437**	1.000
		Sig. (2-tailed)	0.014	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is < 0.05 , which is 0.014, indicating that the implementation of *hand hygiene* SOPs among health workers and support staff has a significant effect on commitment indicators in the patient safety culture at Nala Husada Dental Hospital. The correlation coefficient was 0.437, indicating a moderate strength of the relationship between the variables.

Table 15 Spearman Correlation Test Results of the Effect of Hand Hygiene SOP Implementation on Competency Indicators.

Correlations				
			Implementation of Hand Hygiene SOP	Competition
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.453*
		Sig. (2-tailed)	.	0.011
		N	31	31
	competition	Correlation Coefficient	0.453*	1.000
		Sig. (2-tailed)	0.011	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is < 0.05 , specifically 0.011, indicating that the implementation of hand hygiene SOPs among healthcare workers and support staff has an influence on the competency indicators of patient safety culture at Nala Husada Dental Hospital. The correlation coefficient is 0.453, indicating a moderate level of influence between the variables.

Table 16 Results of Spearman Correlation Test on the Effect of Hand Hygiene SOP Implementation on Facility Indicators

Correlations				
			Implementation of Hand Hygiene SOP	Facilities
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.281
		Sig. (2-tailed)	.	0.125
		N	31	31
	Facilities	Correlation Coefficient	0.281	1.000
		Sig. (2-tailed)	0.125	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is >0.05 , which is 0.125, so it can be concluded that there is no effect of hand hygiene SOP implementation on healthcare workers and support staff on facility indicators.

Table 17 Spearman Correlation Test Results of the Effect of Hand Hygiene SOP Implementation on Perception Indicators

Correlations				
			Implementation of Hand Hygiene SOP	Perception
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.474**
		Sig. (2-tailed)	.	0.007
		N	31	31
	Perception	Correlation Coefficient	0.474**	1.000
		Sig. (2-tailed)	0.007	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is < 0.05 , which is 0.007, indicating that the implementation of *hand hygiene* SOPs among health workers and support staff has a significant effect on perception indicators in patient safety culture at Nala Husada Dental Hospital. The correlation coefficient was 0.474, indicating a moderate level of influence between the variables.

Table 18 Spearman Correlation Test Results of the Effect of Hand Hygiene SOP Implementation on Value Indicators

Correlations				
			Implementation of Hand Hygiene SOP	Value
Spearman's rho	Implementation of Hand Hygiene SOP	Correlation Coefficient	1.000	0.386*
		Sig. (2-tailed)	.	0.032
		N	31	31

	Value	Correlation Coefficient	0.386*	1.000
		Sig. (2-tailed)	0.032	.
		N	31	31
**. Correlation is significant at the 0.01 level (2-tailed).				

The Sig. value (2-tailed) is < 0.05 , specifically 0.032, indicating that the implementation of hand hygiene SOPs among healthcare workers and support staff influences the value indicators of patient safety culture at Nala Husada Dental Hospital. The correlation coefficient is 0.386, indicating a low level of influence between the variables.

4. Discussion

Univariate analysis of the practice of the standard operational procedure for hand hygiene reveals that, based on the observation results, the Health Service in the Dental Hospital of Nala Husada consistently implements the standard procedural hand hygiene according to the established guidelines. Meanwhile, based on the results of the questions, the majority of the health services show very high scores. That means that most of the healthcare staff at the Dental Hospital of Nala Husada have a proper understanding of hand hygiene implementation. These also show that the understanding of health services at Nala Husada Dental Hospital is progressing appropriately with the implementation. Because proper understanding also tends to have good application.¹⁴

The results of the questions indicate that most health services at Nala Husada Dental Hospital understand the standard procedures for hand hygiene. According to the observation results, supporting personnel, especially those working in the service unit, have consistently applied the hand hygiene standard procedure according to the standard. Meanwhile, among the supporting staff in the non-service unit, the majority have implemented the hand hygiene standard procedure with good service, although a small number are categorized as poor. This means that although most of the supporting staff have a decent understanding of hand hygiene, a few of them have been inconsistent with its implementation. Understanding and knowledge are important factors, but do not always influence the implementation of health behavior.¹⁵

The patient safety culture at Nala Husada Dental Hospital generally receives a very good score. The rates of each patient safety culture indicator show perception indicators resulting in high ratings. This means that the health services and supporting staff at Nala Husada Dental Hospital have a positive perception of patient safety culture, and patient safety is considered a top priority. Supported by the perception that Nala Husada Dental Hospital has always been committed to creating a strong patient safety culture, the policies and procedures for patient safety culture in Nala Husada Dental Hospital are easy to follow. According to the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety, hospital Culture services will perceive patient safety as decent. In contrast, with the policy and implementation of patient safety procedures, the safety of the patients has always been systematic and fully supported by their hospital.¹⁶

The indicator with the second-highest rating is the rating indicator. This means that the health services and supporting staff of Nala Husada Dental Hospital consider patient safety a high priority in every action. The hospital prioritizes patient safety and understands the importance of hand hygiene implementation, which significantly influences patient safety.¹⁷

The next indicator, with the third-highest rating, is the attitude and commitment indicator. The attitude indicator shows that the health service and supporting staff at Nala Husada Dental Hospital consistently follow hand hygiene procedures by the applied standard, never missing any important steps to maintain patient safety. A decent attitude and optimism about hand hygiene protocols play a crucial part in this effort.¹⁹

The indicator with the fourth-highest rating is the competence indicator; this means that the health service and supporting staff at Nala Husada Dental Hospital have grasped the correct hand hygiene technique and understood the times and situations that require hand hygiene procedures. Decent competence gained through practical training regarding correct hand hygiene techniques decreases hospital infection and raises patient safety.¹⁸

The next lowest indicator is *facilities*. This occurs because some respondents still lack access to basic hand hygiene facilities, such as soap and tissues, while at work. Hand hygiene is one of the most effective ways to prevent hospital infections. However, without adequate facilities, its implementation often falls short of being optimal.²

Then, a bivariate test will be conducted to observe the effect of implementing hand hygiene SOP on patient safety culture in general and each indicator. The implementation of hand hygiene SOP affects the attitude indicator in patient safety culture with a strong correlation. When *hand hygiene* procedures are performed correctly, it demonstrates a strong commitment and a positive attitude toward creating a safe environment for patients. Therefore, *hand hygiene* SOP implementation becomes an important indicator to increase awareness and behavior regarding patient safety.¹⁹

The implementation of *hand hygiene* SOP also affects the *commitment* indicator in patient safety culture with a moderate level of correlation. According to Azhari, good *hand hygiene* practices reflect a high commitment to patient safety. Following proper hand hygiene standards prevents nosocomial infections and demonstrates a serious commitment to maintaining service quality and fostering a strong patient safety culture.²⁰

The implementation of hand hygiene SOP affects the *competency* indicator in patient safety culture with a moderate level of correlation. According to Sari, good *hand hygiene* practices are closely related to competency in supporting patient safety. This happens because compliance with hand hygiene procedures increases awareness and skills in preventing or breaking the chain of infection in hospitals. This implementation becomes an important indicator to measure the awareness, skills, and consistency of hospital staff in creating a safe environment. Therefore, optimal *hand hygiene* practices demonstrate a higher level of competency in patient safety practices.¹⁸

The implementation of *hand hygiene* SOP does not affect the *facility* indicator in patient safety culture. According to Insani & Abdillah, factors such as attitude, perception of infection risk, and habits play a bigger role in determining the success of patient safety implementation. Even though supporting facilities are available, their effectiveness strongly depends on individual behavior and the organizational culture in the hospital.²¹

The implementation of *hand hygiene* SOP affects the *perception* indicator in patient safety culture with a moderate level of correlation. This indicates that the effective and consistent implementation of *hand hygiene* SOPs improves the perception of patient safety culture. WHO emphasizes that compliance with *hand hygiene* procedures is an important indicator of a strong patient safety culture, where this practice strengthens the perception that patient safety is a top priority.²²

The implementation of *hand hygiene* SOP also affects the *value* indicator in patient safety culture, with a low level of correlation. According to Tartari & Storr, the consistent implementation of *hand hygiene* SOPs shows a commitment to safe practices. This reflects the value of patient safety, which eventually becomes an integral part of the organizational culture. Research shows that individuals who comply with SOP tend to have a better perception of the value of patient safety.²²

The correlation level of the *value* indicator falls into the low category. This may happen due to the more decisive influence of other aspects such as *attitude*, *perception*, and *commitment*. Attitude toward *hand hygiene* often becomes the main driver in shaping a safety culture. The perception of the importance of patient safety also plays a key role, especially when hospital staff believe that it impacts service quality. Commitment from management and leadership has a strong influence on strengthening the patient safety culture. When individuals and the organization (the hospital) do not actively prioritize safety culture, the implementation of SOPs such as hand hygiene weakens the values within the patient safety culture.²³

Overall, implementing hand hygiene SOP by healthcare workers and support staff influences the patient safety culture at Nala Husada Dental Hospital. The correlation coefficient in this study is positive, indicating a direct relationship between the two variables. This means that as the implementation of *hand hygiene* SOP improves among healthcare workers and support staff, the patient safety culture also improves. This finding aligns with Sawafi, who states that adherence to *hand hygiene* policies enhances the safety culture within an organization.¹² It also supports the findings of Syabanasyah and Solehudin, who report that compliance, consistent practice, and implementation of patient safety culture contribute to increased patient safety.¹³ Strengthening patient safety culture requires institutional support, including the consistent application of established hospital SOP.¹⁰

5. Conclusion

The implementation of hand hygiene Standard Operating Procedures (SOPs) by healthcare professionals and support staff has a significant influence on the development and reinforcement of a patient safety culture at Nala Husada Dental Hospital. This correlation is especially evident in dimensions such as attitude, perception, commitment, and competency. These findings underscore the importance of sustained hand hygiene practices, not merely as infection control measures but also as strategic tools for embedding safety values across institutional levels. Enhancing patient

safety culture thus requires integrated efforts encompassing procedural adherence, continuous training, and leadership-driven safety reinforcement.

Compliance with ethical standards

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Disclosure of conflict of interest

All authors declared that no conflict of interest regarding the publication of this manuscript.

Statement of informed consent

All individual participants provided informed consent for this study.

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