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Self-Leadership and Nurses Competence in Infection Prevention and Control in Hospital

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ABSTRACT
Infection Prevention and Control (IPC) is a core competency for nurses in hospital. However, several instances of infections caused by suboptimal nursing competencies in IPC are still observed, which can lead to patient safety issues. Nurse self-leadership is one way to enhance nursing competencies in IPC. This study aims to identify the relationship between self-leadership and nursing competencies in infection prevention and control in hospital. The research design used a descriptive correlation approach with a simple random sampling technique. The study was 98 nurses. This study was conducted using the Pearson correlation coefficient (r). The results of the study showed that nurse self-leadership was in the moderate category with a mean value of 3.06, and nursing competencies in infection prevention and control were also in the moderate category, with a mean value of 63.79. The study found a significant relationship between self-leadership and nursing competencies in infection prevention and control, with a r = 0.385, p-value 0.000 (< 0.05), indicating a weak relationship. The component of self-leadership that scored the highest was behavior-focused strategies. In conclusion, higher self-leadership among nurses is associated with better nursing competencies in IPC. It is recommended that ward managers develop the self-leadership skills and competencies of nurses in infection prevention and control through structured training programs. Improving self-leadership skills can enhance nursing competencies.

Keyword: Hospital, Humans, Leadership, Patient Safety, Research Design

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1. Introduction

Nurses are healthcare workers who provide healthcare services to the public according to hospital standards. Hospital healthcare standards include the implementation of standard precautions for infection prevention and control (Al-Faouri et al., 2021). Infection prevention and control standards as an approach to protecting patients, healthcare workers, and healthcare facility visitors from healthcare-associated infections, and leadership engagement as a strategy to foster commitment to achieving IPC standards (WHO, 2023). Strong leaders who serve as role models generally succeed in achieving excellence in infection prevention and control practices (National Health Protection, 2025).

However, a study conducted by Ketata et al., (2021) in a teaching hospital found that 65 patients had one type of infection during treatment. A 2022 survey of several hospitals in the United States showed that the incidence of hospital infections in 26 states was worsening (Blot et al., 2022). In the United States, there are 20,000 deaths annually due to infections (WHO, 2018). Infection prevention and control are part of the core competencies of nurses according to (WHO, 2020).

Nurse competencies in infection prevention and control consist of knowledge, attitudes, and skills (Hyeon & Moon, 2024). The results of a survey by Mita et al., (2022) showed that 10 out of 7 nurses had not implemented infection prevention properly, around 33% of nurses did not implement hand hygiene five moments after performing a procedure, and 60% of nurses were still lacking in infection prevention and control in hospitals. Alhumaid et al., (2021) stated that nurses' behavior was poor in infection prevention and control due to a lack of knowledge in infection control. Lack of competence among nurses in hospitals led to problems in infection prevention and control (Ketata et al., 2021).

There is still a gap in Indonesia, the results of a study by Astuti et al. showed that 20% of nurses had a good level of knowledge, but 42.4% of nurses were poor in infection prevention and control (Astuti et al., 2020). Only 37.5% of nurses in hospitals use Personal Protective Equipment (PPE) for infection prevention and control (Sugiarti et al., 2026). Data on nurse competency indicates that 70.5% of nurses perform well (Heldawati et al., 2022). Therefore, the way for nurses to develop competency in nursing services is through self-leadership (Knotts & Houghton, 2021). The data indicate that there is still a gap in nurses' self-leadership when it comes to implementing infection prevention and control measures for patients in hospitals.

Self-leadership is a necessary skill for nurses (Jinyan et al., 2021), as it has been proven to bring about positive changes for nurses (Rembet et al., (2023). Research has found that nurses' self-leadership is at a poor level in hospitals (Jinyan et al., 2021). Jinyan et al., (2021) state that self-leadership is divided into three general categories: behavior-focused strategies, natural reward strategies, and constructive thought pattern strategies (Anderson & Prussia, 1997). The results showed that nurses scored lower on the constructive thought pattern strategies dimension than other aspects. Novice nurses who lack clinical experience face challenges in developing self-leadership. Nurses face obstacles in developing self-leadership, including hospitals' lack of recognition of the importance of nurses' competency in self-leadership (Kim & Sim, 2020).

Nurse empowerment can improve nurses' competence in providing nursing care to patients (Prinsloo et al., 2019). A positive work environment can improve infection prevention and control efforts in hospitals compared to a negative work environment for nurses (Laia et al., 2022). However, there remains a gap between empowered nurses and a supportive work environment, which hinders nurses' ability to improve infection prevention and control. This phenomenon provides insights for researchers interested in investigating the relationship between self-leadership and nurses' competencies in infection prevention and control in hospitals.

2. Methods

2.1. Type of Research

The research method was cross-sectional with a descriptive correlation design that describes the relationship between the two variables. The research method known as the survey is a method that involves collecting samples from a population by means of a questionnaire as a means of data collection.

2.2. Location and time of research

The study population was all nurses working in the inpatient ward of a Medan government hospital. The period of time for the research began in August 2024 and lasted until January 2025.

2.3. Population and sample

The total population was 217 nurses. The sample calculation used a power analysis of 0.8 from previous research (Yildirim & Msn, 2021). The conventional effect size value of 0.80 resulted in a sample size of 88 people (Polit & Beck, 2018). The researcher determined a dropout sample (Lwanga & Lemeshow, 1991) and obtained a sample size of 98 nurses. Inclusion criteria included working in the inpatient ward, being a permanent employee at the hospital, being willing to participate in the research, and having a minimum education of a diploma in nursing. The exclusion criteria were nurses on leave. The research technique used simple random sampling. The method of random sampling was for the researcher to input the nurses' names based on odd numbers and inclusion criteria, code the list of names, and randomly select a number generator until the sample size is obtained.

2.4. Research Instruments

The validity test used construct validity with the Pearson Product Moment test, based on the r table value and r count (df = n-2), which means 30-2 = 28, resulting in an r table value of 0.3610 (Sugiyono, 2020). The self-leadership instrument used by the researcher obtained a score of 1.00, and the nurse competency instrument in infection prevention and control obtained a score of 1.00. The reliability test using Cronbach's

alpha for self-leadership was 0.907, and for infection prevention and control competency, it resulted in 0.746. The self-leadership (Anderson & Prussia, 1997) has 30 statement items (23 positive statements and 7 negative statements). The self-leadership score range consists of Low (2.00–3.00), Moderate (3.01–4.00), and High (4.01–5.00). The Nurse Competency Instrument in Infection Prevention and Control Hyeon & Moon, (2024) and WHO, (2020) have 29 statement items (21 positive statements and 8 negative statements). The researcher first changed the values of several questionnaire items that had unfavorable question directions before starting data processing, then carried out the data processing stage. The range of nurse competency scores in IPC consists of low: 20–59, moderate: 60–79, and high: 80–100.

2.5. Data Collection

The researcher first requested a list of the ward nurses' names from the inpatient ward chief. Each nurse who was received from the hospital was coded by the researchers in order to gather data. Based on the nurse's serial number, the researcher then used a spin number generator to randomly assign the participants. A potential respondent who was chosen to participate in this study is identified by the serial number on the spin. After that, the researcher met with potential participants and explained the goal and methodology of the data collection process. After nurses consented to participate in the study, the researcher gave them a form to fill out to indicate their interest in participating. Questionnaires on demographics, self-leadership, and nurses' competency in infection prevention and control in hospitals were distributed by researchers. Following the acquisition of the research data, the researchers used a computerized method to analyze the data.

2.6. Measurement and Analysis methods

According to a curve histogram with a symmetrical bell-shaped section, the data were normally distributed, and the normality test, which employed the Kolmogorov-Smirnov test, produced a value of $p = 0.2$ ($p > 0.05$). A table of mean and standard deviation distributions for age and length of service data shows the findings of the univariate analysis of demographic data. This study's analysis uses mean values to describe age and length of service data, while categorical values are used to describe gender and educational attainment. Because the data was normally distributed, the researchers decided to employ the Pearson test as their bivariate analysis.

2.7. Ethical Clearance

In the beginning, the researcher presented prospective respondents with an informed consent sheet in order to obtain their permission to grant consent before beginning the process of data collecting. If the potential respondent is willing to participate, the researcher will then directly give them with a questionnaire that includes research question items, as well as a description of the research, its objectives, and the benefits of participating in the research. This research has passed the ethical test from the Universitas Sumatera Utara with number: 1110/KEPK/USU/2024.

3. Results

The results of this study are based on data on the demographic characteristics of nurses, their self-leadership, and their competency in infection prevention and control. The results are described as follows:

3.1. Demographic Characteristics of Nurses

Table 1 shows that the average age of nurses is 40 years, indicating that most nurses are in the productive age group with an average length of service of 14 years. Gender was the most common 79.6%, and there was almost no difference in education level between nurses with diplomas and bachelor's degrees in nursing.

Table 1 Demographic Characteristics of Nurses (n=98)

Characteristics	Frequency	Percentage
Age	mean 40.39	SD 10.35
Length of service	mean 13.89	SD 8.20
Gender		
Male	20	20.4
Female	78	79.6

Table 1 Continued

Characteristics	Frequency	Percentage
Education level		
Diploma	47	48
Professional	5	5.1
Bachelor of nursing	46	46.9

3.2. Distribution of Nurse Self-Leadership

Table 2 shows an average nurse self-leadership score of 3.06 with an SD of 0.25. Based on the mean value, nurse self-leadership falls into the moderate category. The Constructive Thought Pattern Strategies dimension had the highest average score of 3.50, followed by the Natural Reward Strategies dimension with the lowest score of 2.48.

Table 2 Distribution of Nurse Self-Leadership in hospital (n=98)

Category	Self-leadership	
	Mean	SD
Behaviour focused strategies	3.15	0.14
Natural reward strategies	2.48	0.27
Constructive thought pattern strategies	3.50	0.46
Total	3.06	0.25

3.3. Distribution of Nurse Competencies in Infection Prevention and Control in Hospital

The challenges experienced by nurses in providing care for children with tuberculosis (TB) vary considerably and are often influenced by their years of professional practice and clinical experience. These challenges encompass emotional strain, concerns regarding occupational exposure to infection, and the inherent complexities of delivering pediatric TB care. The present study identified three overarching themes that characterize these barriers: emotional burden, fear of infection, and the clinical complexity of pediatric TB management.

Table 3 Distribution of Nurse Competencies in Infection Prevention and Control in Hospital (n= 98)

Category	Nurses Competencies in Infection Prevention and Control	
	Mean	SD
Basic microbiology	71.84	9.77
Critical thinking	58.78	7.93
Patient communication and assessment	51.89	13.76
Adherence of IPC Guideline	79.71	9.46
Patient education	72.96	8.02
Infection control leadership	73.01	8.36
Prevention of occupational infections	63.57	8.46
Total	63.79	4.54

3.4. Self-leadership and Nurse Competence in Infection Prevention and Control in Hospital (n=98)

Table 4 shows a relationship between self-leadership and nurse competence in infection prevention and control, with a p-value of 0.000. The data demonstrates that higher nurse self-leadership improves competency in infection prevention and control in hospital. However, the two variables have a weak positive relationship (r= 0.385), and r^2 = 0.148, which means that 14.8% of the variation in nurses' competence in the area of infection prevention and control can be attributed to self-leadership.

Table 4 The relationship between self-leadership and nurse competence infection prevention and control (n= 98)

Variables	Correlation coefficient (r)	p
Self-leadership	0.385	0.000*
Nurses Competence in IPC	0.385	0.000*

4. Discussion

Nurses' self-leadership is in the moderate category. The data indicates that nurses still need to improve their self-leadership skills to lead and manage themselves in providing services. High self-leadership reflects nurses' ability to establish strategies to control their behavior and thoughts in every action. The dimension of constructive thought pattern strategies is higher than that of natural reward strategies, which are the lowest. The data show that nurses tend to apply constructive thought pattern strategies and behavior-focused strategies compared to natural reward strategies. Constructive thought pattern strategies indicate that the majority of nurses are able to apply constructive thought pattern strategies, although not optimally. The results of this study are inconsistent with the research of Kamil et al., (2021), which stated that the majority of nurses' constructive thought pattern strategies in hospitals are in the moderate category.

The results of this study found that natural reward strategies were the lowest, indicating that nurses' awareness of infection prevention and control remains low. Nurses are not yet competent and do not yet realize the importance of protecting patients from infection. This is inconsistent with findings from other studies indicating that nurses with competent natural reward strategies can improve infection prevention and control, leading to enhanced performance (Prinsloo, 2023). In line with the statement by Sari & Kirana (2023) nurses' adherence to standard operating procedures helps minimize occupational risks, thereby creating a conducive work environment. Goldsby et al. (2020) state that fostering a positive attitude in a work setting serves as a natural reward for nurses.

Every action taken by nurses provides satisfaction if it has a positive impact, thus motivating them. The best results from each nursing action are achieved by considering appropriate actions with constructive thinking strategies. Research results show that behavior-focused strategies are at a moderate level. Nurses are not yet accustomed to implementing behavior-focused strategies (Rahman et al., 2023). Nurses pay little attention to the importance of self-awareness in their behavior when completing tasks. These results align with research by Jinyan et al., (2021), which found that the majority of nurses' self-leadership levels are at a moderate level. There are few opportunities for nurses to receive self-leadership training. These data result in nurses working under the direction of the ward head lacking self-awareness of their work and lacking the ability to motivate and direct themselves.

The nurses' self-leadership level is in the moderate category Jinyan et al., (2021) that nurses do not recognize self-leadership as a necessary skill for every nurse, which is a factor influencing the development of nurse self-leadership. Obstacles in thinking during difficult situations make it difficult for nurses to establish positive dialogue, thus affecting their ability to think clearly. The statement in the questionnaire item about nurses increasing their preferred activities in doing their work to continue enjoying their work is included in the natural reward strategies dimension. These results are in line with research that found nurses have good natural reward strategies (Sari & Kirana, 2023). However, this is inconsistent with research by Ramadhiani & Siregar (2019), which stated that nurses have poor thinking strategy abilities.

The results of the study indicate that the majority of nurses' competency levels are at a moderate level. These results are supported by Astuti et al., (2020), who stated that nurses' competency in infection prevention and control is at a moderate level. The lack of nurse competency in infection prevention and control in hospitals is due to a lack of evaluation of training in infection prevention and control. Nurses' compliance with IPC guidelines received the highest score. These results align with those of Sulisno et al., (2022), who stated that the majority of nurses comply with implementing IPC guidelines in hospitals. Nurses' compliance with IPC guidelines drives success in infection prevention and control.

One way to assess patients is through communication between nurses and medical staff regarding potential risks and symptoms of infection in patients, as communication is a key component of infection prevention and control competencies for nurses (Massaroli et al., 2019). Results related to competency in communication and patient assessment received the lowest scores. Mawikere et al., (2021) stated that this occurs because the high workload of nurses leads to a lack of communication between patients and nurses. However, these results are inconsistent with those of (Heldawati et al., 2022), who stated that most nurses have high competency compared to moderate competency. This data occurs due to differences in the location and work culture of nurses. This study indicates that communication between nurses and other healthcare professionals is not yet effective and that barriers still exist, which may hinder infection prevention and control for patients.

Self-leadership is related to nurses' competence in infection prevention and control in hospitals. This finding is supported by the theory that self-leadership skills support nurses in carrying out high job demands in infection prevention and control in hospitals (Dorssen-Boog et al., 2020). The description of the research results proves that internal motivation is very important in determining the success of their competence to

develop in providing nursing care based on patient safety. Nurses can improve IPC competence as part of clinical competence by improving self-leadership in hospitals. A limitation of this study is that the researchers did not collect demographic data on the nurses to determine whether such data might be associated with their competencies in IPC. The number of nurses in this study was limited to a single hospital, so the findings cannot yet be generalized to all hospitals.

5. Conclusion

Self-leadership and nurse competence in infection prevention and control in hospitals have a relationship, although the strength is weak. Higher self-leadership can increase nurse competence in infection prevention and control in hospital. Constructive thought pattern strategies are higher than other self-leadership dimensions. In order to satisfy infection prevention and control criteria for patients, nurses should exercise autonomy in carrying out their jobs, think independently, and not always rely on supervisors. In turn, managers and supervisors can empower nurses to promote a patient safety culture in the hospital by fostering a supportive work environment. Nurse managers in hospitals can improve the self-leadership of their subordinates through self-leadership training and provide external motivational support to increase internal motivation in achieving IPC competency for patient safety from nurse managers in hospitals.

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Author contribution

All authors contributed to the study, data collection, design, data analysis, and interpretation of results. All authors contributed to preparing the manuscript.

Conflict of Interest

The authors declare no competing interests.

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