

Factors related to nurse compliance in monitoring infusion fluid in hospital

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Abstract

Infusion therapy involves the intravenous administration of drugs, fluids, and blood products to hospitalized clients. This study aimed to identify factors influencing nurse compliance in monitoring infusion fluids according to Standard Operating Procedures (SOPs). The research adopted a quantitative approach with a descriptive correlational design and a cross-sectional approach, focusing on a study population of 50 nurses. Data collection utilized observation techniques and questionnaires as research instruments, with the analysis employing Kendall's Tau B and Kendall's Tau C methods. The findings revealed significant correlations between age ($p=0.000$), education ($p\text{-value}=0.006$), career path level ($p=0.013$), and knowledge ($p=0.011$). However, there was no significant relationship between the length of work experience and nurse compliance in monitoring infusion fluids ($p=0.257$) according to SOPs in this private hospital. To enhance the quality of care, it is recommended that nurses receive additional training provided by the nursing education team at the hospital, focusing specifically on the monitoring of infusion fluids. This targeted training could contribute to reducing instances of complaints related to mismatched patient needs and ultimately improve compliance with established SOPs in infusion therapy.

Introduction

Infusion therapy involves administering drugs, fluids, and blood products or conducting blood sampling through an intravenous therapy route for hospitalized clients.^{1,2} This action is commonly employed as first aid for clients experiencing issues such as bleeding, dehydration, or hypovolemic shock. Infusion therapy proves to be an effective and efficient means of providing intravascular fluid supply, a critical aspect considering the potential dangers associated with incorrect administration levels - be it too little or too much.³⁻⁵ Administering intravenous fluids at an incorrect level can pose risks to the client's well-being. Excessive administration may lead to fluid overload, manifesting in symptoms such as headaches, high blood pressure, anxiety, and difficulty breathing. Additionally, the impact of infusion therapy is often accompanied by the occurrence of phlebitis. To assess the success of infusion therapy, monitoring by nurses is imperative, particularly in a 24-hour setting where early detection of risks is crucial for patient safety. The vigilance of nurses during infusion therapy plays a vital role in preventing potential complications and ensuring the well-being of patients.⁶⁻⁸

In British hospitals, 90% of patients undergo infusion therapy during their treatment period.⁹ In contrast, data from the Ministry

of Health in Indonesia (2013) reveals that the incidence of phlebitis was approximately 50.11% in government hospitals and 32.70% in private hospitals. Nurses, as providers of nursing care, are responsible for the installation and monitoring of infusions.¹⁰ Nurse compliance in performing infusion monitoring procedures is influenced by individual behavior. This perspective aligns with previous studies, suggesting that compliance behavior can be attributed to both internal and external factors.^{4,11-13} According to the Indonesian Ministry of Health (2017), phlebitis holds the highest rank among infections in Indonesia, with an incidence of 50.11% in government hospitals and 32.70% in private hospitals.¹⁴ A preliminary survey conducted at Tgk Chik Ditiro Sigli Hospital in Pidie Regency indicates a concerning increase in phlebitis cases over the past three years. In 2018, there were 3,923 cases, followed by 1,780 cases in 2019. Shockingly, from January to August 2020, a staggering 9,646 cases were recorded. This alarming trend underscores the importance of addressing and mitigating phlebitis incidents to enhance patient safety and well-being.¹⁵

According to the General Hospital Census Report by Dr. Zubir Mahmud, the average incidence of phlebitis in 2018 across all rooms was 36.31%. The internal medicine department reported the highest number of cases, reaching 115.¹⁶ Internal factors contributing to phlebitis incidence encompassed age, length of work, and educational level of nurses. External factors included the level of career path and workload. Assessing a nurse's compliance in performing infusion fluid monitoring procedures must also consider their knowledge regarding the hospital's Standard Operating Procedures (SOP). This knowledge is a crucial aspect influencing a nurse's adherence to established protocols and procedures, ultimately contributing to the prevention of phlebitis incidents, so that the duration of treatment and the risk of complications in the patient can be prevented from the beginning.^{17,18}

During observations at a hospital in Pariaman Regency, the researchers noted that some nurses did not consistently monitor intravenous fluids and infusion drops as required. Consequently, the administration of infusion fluids did not align with the prescribed therapy, resulting in variations in quantity, and in some instances, the absence of fluid in the infusion drip room. Such lapses can have adverse effects, potentially leading to patient complaints. Given this phenomenon, the researchers were motivated to investigate the factors influencing the monitoring of infusion fluids in hospitals. Understanding these factors was essential for improving the adherence of healthcare professionals to established protocols and ensuring the effective and safe delivery of medical therapies. This study aimed to identify factors influencing nurse compliance in monitoring infusion fluids according to Standard Operating Procedures (SOP).

Materials and Methods

This research was an observational research method employing a descriptive correlational research design with a cross-sectional approach. The variables under consideration included age, education, years of work, career level, and knowledge, all collected simultaneously. The study involved a sample of 50 nurses in a hospital, selected using a purposive sampling technique based on the population size. The research instrument consisted of a knowledge questionnaire with 20 questions developed and validated by the researcher. The validity and reliability of the questionnaire were tested with a sample of 50 participants, yielding a Cronbach's Alpha value of 0.939, indicating high reliability. Ethical clearance

for this study was obtained from the Research Ethics Committee at Universitas Negeri Padang (No. 25.01/KEPK-UNP/III/2022). The analysis in this research aimed to explore the relationship between nurse characteristics and compliance. Bivariate analysis techniques such as Kendall's Tau B and Kendall's Tau C were employed to examine these relationships.

Results

Table 1 provides an overview of the respondent characteristics. Among the 50 participants, the majority fell within the age range of 26-35 years, comprising 20 respondents (40%). Additionally, the educational background analysis revealed that 38 respondents (76%) had a diploma. In terms of working experience, 21 respondents (42%) had been employed for over 9 years, and 20 respondents (40%) were at the competent career path level.

The distribution of respondents based on knowledge indicated that, among the hospital staff, the majority possessed good knowledge, with 14 respondents (28%). Furthermore, when compliance was assessed through a 3-day observation of respondents' control and regulation of infusion drops, it was revealed that 20 respondents (40%) demonstrated adherence among the 50 respondents in the hospital.

The bivariate analysis aimed to examine a direct relationship between the independent variables and the dependent variable. In this study, the analysis sought to understand the relationship between the characteristics of nurses, specifically age, education, length of work, level of career path, and knowledge of compliance.

The results of the study are presented in Table 2. Out of 50 respondents, the highest level of compliance in the monitoring of infusion fluids was obtained by the age range of 26-35 years. Fifteen people were obedient and 5 non-compliant, while in education, the highest level of compliance with monitoring of infusion fluids in diploma education was 28 people, while those who did

Table 1. Frequency distribution based on respondents' characteristics.

Characteristics of respondents	n	%
Age		
17-25 years	13	26
26-35 years	20	40
36-45 years	10	20
46-55 years	7	14
Education		
Diploma	38	76
Bachelor of Nursing	12	24
Working experience		
2-6 years	19	38
6-9 years	10	20
>9 years	21	42
Career level		
Novice	16	32
Advanced beginner	14	28
Competent	20	40
Knowledge		
Enough	14	28
Good	36	72
Obedience		
Obedient	20	40
Disobedient	30	60
Total	50	100

not comply were 10. At the length of work with compliance in the monitoring of the infusion fluid, the highest score was obtained at the length of work over 9 years, which is 17 people, while the non-compliant 4 people, at the career level with compliance with the monitoring of the infusion fluid, the highest score was obtained at the Competent Career Level, which is 17 people, while non-compliant as many as 3 people. At the level of knowledge with compliance of the monitoring of the infusion fluid, the highest score was obtained on good knowledge, 22 people, while those who did not comply were 4 people, with a value of $p < 0.05$. This shows a significant relationship between age, education, length of employment, competence, and level of knowledge and compliance.

Discussion

This study employed an inversely proportional approach, revealing a significant relationship between age and adherence to treatment. In contrast to previous research, which found no correlation between age factors and nurse compliance in applying Hospital Fall Patient Standard Operating Procedures (SOP), our study identified a notable association. Nurse compliance with Hospital SOPs was observed more frequently in junior care settings.^{19,20} Senior nurses, having accumulated experience in their work environment, tend to exhibit greater adherence. Conversely, junior nurses may experience dissatisfaction, potentially stemming from elevated expectations that might not align with the realities of their work environment. This incongruity between expectations and realities can lead to dissatisfaction and non-compliance among junior nurses. The study observed that older individuals tend to be more obedient. Age, as a marker of different life stages, is particularly crucial. During this period, life structures become more fixed and stable. The maturity that accompanies aging is reflected in enhanced thinking and working abilities.²¹ More mature individuals tend to be more reliable, attributed to the experiences and maturity of the soul. Notably, respondents aged 26-35 years, considered young adults, shoulder responsibilities, and possess decision-making abilities aligned with their developmental stage. This stage of young adulthood indicates a level of maturity and responsibility in carrying out tasks and making decisions.

The results showed an inversely proportional statement: individuals with higher education will be more able to think broadly and have more initiative, so they can find more efficient ways at work that lead to job satisfaction and compliance.²² This is also not in line with previous research, as there is no relationship between education level and adherence to SOP standards for infusion in Prof. Dr. R.D Kandou Manado's study.²³ According to researchers, there are more respondents with a diploma in nursing educational background than a bachelor's in nursing. In addition, health education is the basis for officers to behave, so it will be easier to instill discipline or obedience. This is caused by officers who understand health problems based on the knowledge gained during education, training, and in their daily tasks. The knowledge and experience of nurses help improve the skills of nurses in nursing services at hospitals,²⁴ further increasing nurse compliance in monitoring intravenous fluids and other factors that cause infusions to run out on time, because there is no relationship between length of work with nurse compliance in monitoring infusion fluids according to the SOP in the Couch Room of Aisyiyah Pariaman Hospital.²⁵

In the Safa Room of Aisyiyah Pariaman Hospital for the Diploma of Nursing, the career level is competent, and the length of work is >9 years, so there is more experience in daily practice

at work, as well as attending lots of training or training to add to the skills one has. From the results of the study in Table 2, it is stated that 17 respondents had a working period of more than 9 years and were not compliant, and 4 respondents were not, meaning that the working period was not significantly related to compliance. Length of work causes a person to become more skilled and experienced in dealing with work problems so that the work results obtained bring satisfaction.²⁶⁻²⁸ This is in line with the previous research, which found no relationship between the length of work and emergency unit training and adherence to SOPs for infusion.²³ According to the researchers in this study, there is no significant relationship between the length of work and compliance because a person is considered obedient or disobedient, not based on the length of work in the installation. But judging from daily activities in the workplace in accordance with the SOP policy, a person's length of work does not correlate with the level of compliance because the longer a person's work will increase experience in carrying out nursing actions. Nurses with a career level of competence have higher workloads so nurses delegate the task of monitoring infusions to nurses at the Novice or Advanced beginner career levels, because career paths will improve the quality of nurse work, nurses will try to control a better career so that they will continue to excel and earn job satisfaction.²⁹

The Ministry of Health of the Republic of Indonesia (2006) regarding nurse career paths included clinical nurses, nurse managers, nurse educators, and nurse researchers.³⁰ Survey data in 2010 at hospitals stated that 88.6% of room heads and 94.3% of team leaders/executive nurses stated that there was a need for a clinical nurse career path.³¹ According to the researchers, the results of this study show that nurses with the Novice career path still do not have adequate skills in monitoring infusion fluid drops, while nurses with the Competent nurse career path can manage infusion drops according to the program and the client's infusion fluids run out on time. Competent career path nurses have a lot of experience while working and participate in training activities held by the hospital, which affects nurse compliance in monitoring drips; besides manual installation of infusion sets is not an ergonomic task for nurses working in hospitals, besides patient service experience, innovation is needed in monitoring patient

Table 2. Relationship of compliance monitoring of infusion fluids.

Variable	Compliant	Disobedient	p
Age			
17-25 years	5	8	0.000
26-35 years	15	5	
36-45 years	9	1	
46-55 years	7	0	
Education			
Diploma	28	10	0.007
Bachelor of Nursing	5	7	
Work experience			
2-6 years	10	9	0.259
6-9 years	7	3	
>9 years	17	4	
Career level			
Novice	8	8	0.014
Advanced beginner	10	4	
Competent	17	3	
Knowledge			
Enough	6	8	0.011
Good	22	14	

infusion.³² Nurses with experience of >9 years take part in many training programs held by Nurse Education so that knowledge about infusion fluids is updated every year. Besides, the factor of inability to recognize and monitor infusion drops can be due to too much focus on examining infusions and pressure during infusion.³³

The results of the study state that out of 50 respondents with good knowledge, it is known that 22 people are obedient. From the results above, it can be concluded that the better the respondent's knowledge is, the more obedient he will be, and vice versa. This knowledge itself is a person's highest cognitive condition when in contact with reality or existing events. When nurses provide care, nurses should have good knowledge of fluid therapy or infusion therapy and must also have the knowledge and confidence to care for patients receiving infusion therapy.³⁴ From the results of this study, it was found that there was a relationship between knowledge and compliance in monitoring infusion fluids, and this is in line with research which stated that there was a significant relationship between nurses' knowledge about infusion therapy and the incidence of phlebitis.³⁵ It turns out that these results are also supported by research conducted in China, and it was found that most of the nurses in the hospital, even though experienced nurses, apparently did not know about the PH of the liquid, the dressing used, and the impact of using it. needles used for the infusion of drugs.³⁶ Not infrequently, it has also been found that the high knowledge of nurses is not matched by their practice.³⁷ If the nurse's knowledge in monitoring infusion drops is not correct, it will result in clients complaining because the drops run out or are late, not following the doctor's program, and are materially disadvantaged because of the long treatment period.

Conclusions

The study concluded that several factors influence nurse adherence to standard operating procedures for infusion monitoring. These factors include the length of time working in the hospital, career path competence, and having good knowledge regarding the importance of monitoring infusions in patients. To enhance adherence and ensure consistent application of standard procedures, the study suggests that hospital management should create visualization media, such as posters, to facilitate nurse recall of infusion-related SOP. Additionally, it recommends providing regular monthly sessions for socializing and discussing these SOPs with all nurses.

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