

THE RELATIONSHIP BETWEEN NURSE CHARACTERISTICS AND DIABETES MELLITUS PATIENT SAFETY CULTURE IN PEKANBARU CITY

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ABSTRACT

Diabetes mellitus is a long-term disease that continues to increase worldwide, including in Indonesia. It is very important for Diabetes Mellitus patients to get proper and safe care. Patient safety is very important in care, and this should be a top priority in primary health facilities, including health centers. This study aims to analyze how the relationship between nurse characteristics and patient safety culture is implemented in Pekanbaru City health centers, as well as how nurses' understanding of patient safety culture can affect the quality of care. This study used descriptive and explanatory research approaches. The study population consisted of 205 nurses working in 21 health centers in Pekanbaru City. The sampling technique used was total sampling. The instrument used to measure patient safety culture variables and nurses' understanding of diabetes mellitus patient safety was a questionnaire. Data analysis was performed using descriptive analysis techniques and Partial Least Squares. The results showed that there was a significant relationship between nurse characteristics such as length of work, employment status, and age also had a significant effect on the patient safety culture of patients with diabetes mellitus (path coefficient = 0.184 and 0.983). nurse characteristics such as length of work, employment status, and age are very influential on a good patient safety culture that can improve patient safety.

Keywords: Patient Safety Culture, Nurse Understanding, Diabetes Mellitus, Patient Safety, Health Center

INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease characterized by an increase in blood glucose concentration that occurs because the pancreas cannot produce insulin or the insulin produced cannot be used effectively by the body (World Health Organization, 2022). DM is a chronic disease characterized by blood glucose levels that exceed normal values. Where the normal value of blood sugar during (GDS) / without fasting is < 200 mg / dl while fasting blood sugar (GDP) < 126 mg / dl. Diabetes mellitus is caused by a deficiency of the hormone insulin produced by the pancreas to reduce blood sugar levels (Kemenkes RI, 2020).

According to the International Diabetes Federation (2017). Indonesia is ranked the fifth country with the highest number of diabetes with 19.5 million sufferers in 2021 and is predicted to be 28.6 million in 2045 with Diabetes Mellitus sufferers reaching 643 million in 2030 and 783 million in 2045. DM sufferers in Riau Province in 2023 were 90,796 people spread across 12 districts. Pekanbaru City is the first place with

18,044 cases of diabetes mellitus (Riau Provincial Health Office, 2020) Preliminary results that researchers conducted at DKK (City Health Office) Pekanbaru there were 10,094 cases of DM patient visits from 21 Puskesmas in Pekanbaru, with the number of nurses totaling 205 people with Ners and DIII Nursing backgrounds. Nursing personnel hold a pwnting virgin in maintaining patient safety.

Nurses have a vital and strategic role in shaping, maintaining and improving patient safety culture. This role includes direct patient care, education, interprofessional communication, and participation in reporting and quality improvement systems (Mi Lee & Hyunjin, 2020). Nurses play an important role in fostering a culture of safety in healthcare settings. Their characteristics include age, gender, length of service, marital status and employment status. A strong safety culture is characterized by a shared attitude towards safety, transparency in communication, and a non-punitive approach to error reporting, all of which are important traits for nurses (Tremblay, at all. 2020).

Patient safety is one of the main pillars of health care. Patients with chronic diseases such as diabetes mellitus (DM) require special attention as they are prone to serious complications due to mishandling. Safety culture focuses on systematic efforts to minimize risks and prevent injuries or errors that can occur during the health care process (MOH, 2017). Patient safety culture is a set of values, attitudes, and behaviors in the health care system that support the establishment of a safe working environment for patients and health workers. The main focus is on preventing injuries and medical errors, including in patients with chronic diseases such as diabetes mellitus (DM) (WHO, 2021).

A culture of safety can significantly improve the quality of life of patients with diabetes mellitus by fostering an environment that prioritizes error reporting, learning and patient-centered care. This culture encourages healthcare providers to address systemic issues that may contribute to errors, thereby improving treatment outcomes and patient satisfaction. By integrating the principles of safety culture, healthcare systems can better support diabetes self-management, which is critical to preventing complications and improving quality of life. The following section outlines how safety culture can be implemented to benefit diabetes patients (Harolds, 2022).

Patient safety culture in diabetes mellitus care at puskesmas, especially related to the relationship of nurse characteristics, such as length of service, employment status, and age, to safety culture. The emphasis is on the integration of nurses' individual factors (characteristics) in patient safety culture in primary health facilities, especially health centers in Pekanbaru City. This study not only deepens the understanding of the relationship of nurse characteristics to patient safety culture, but also provides insight into how the role of nurses in improving the implementation of diabetes mellitus patient safety can be optimized through policy and continuing education. This study highlights the lack of in-depth understanding of the implementation of patient safety culture in diabetes mellitus care in community health centers, particularly in relation to the influence of nurses' characteristics, such as length of service, employment status, and age, on safety culture and their understanding. This study also emphasizes the importance of integrating nurses' individual factors in the implementation of patient safety culture in primary health facilities, especially puskesmas in Pekanbaru City. Thus, this study aims to analyze how nurses' characteristics affect patient safety culture in puskesmas in Pekanbaru City. This study not only enriches the understanding of the relationship between nurses' characteristics and patient safety culture but also provides an understanding of the relationship between nurses' characteristics and patient safety culture.

METHODS

This study used a non-experimental quantitative method with a descriptive analysis approach and explanatory research to explain the relationship between nurse characteristics and diabetes mellitus patient safety culture. This study used a survey method with a questionnaire to measure these variables. The research was conducted in 21 health centers in Pekanbaru City, with implementation from April to December 2024. The population in this study were nurses working in 21 health centers in Pekanbaru City, with a total number of 205 nurses, using the Total Sampling technique, where all nurses who met the criteria in the population were sampled, namely 205 nurses.

The samples used in this study must meet the inclusion criteria and exclusion criteria that have been set. The inclusion criteria in this study were respondents who had a minimum educational background of DIII Nursing, were not on leave (either annual leave, marriage, childbirth, or illness) during the research process, were not on study assignments or attending education / training that left their duties at the hospital, and were willing to become respondents as evidenced by signing a letter of willingness to become a respondent.

The data collection process uses instruments to measure nurse characteristics (age, gender, length of service, marital status and employment status). and diabetes mellitus patient safety culture in nursing services. Instruments for measuring nurse characteristics (age, gender, length of service, marital status, employment status) and patient safety culture using The Hospital Survey on Patient Safety (HSOPS), which consists of 12 elements Rosyada (2014).

RESULTS

Data analysis in this study used two main techniques, namely descriptive analysis and Partial Least Squares (PLS) analysis. Descriptive analysis is used to provide information about the characteristics of the variables studied. Partial Least Squares (PLS) is a multivariate statistical technique used to analyze the relationship between multiple dependent variables and multiple independent variables. The results of PLS analysis consist of two main models: measurement model (outer model) and structural model (inner model). Hypothesis testing is carried out using direct effect analysis to test the direct effect of the independent variable on the dependent variable. This test uses the Path Coefficient to see the direct effect and the Total Indirect Effect.

REPORTING RESEARCH RESULTS

Table 1. Distribution of Respondent Characteristics (n=205)

Category	Frequency (n)	Percentage (%)
Age		
26-30 year	20	9,8
31-35 year	15	7,3
36-40 year	63	30,7
41-45 year	73	35,6
46 > year	34	16,6
Gender		
Male	36	17,6

Female	169	82,4
Length of Employment		
1-10 year	71	34,6
11-20 year	100	48,8
21-30 year	34	16,6
Marriage Status		
Married	188	91,7
Not Married	17	8,3
Status Kepegawaian		
PNS	165	80,5
PPPK	20	9,8
Honorar	20	9,8
Total	205	100

Table 1 shows the distribution of respondent characteristics based on age, gender, length of service, marital status, and employment status. A total of 205 respondents were involved in this study, with the majority aged between 41-45 years (35.6%), female (82.4%), and had worked between 11-20 years (48.8%). The majority of respondents were married (91.7%) and employed as civil servants (80.5%).

Table 2. Data Distribution of DM Safety Culture in Pekanbaru City (n=205)

Variabel	Frekuensi (n)	Persentase (%)
Informed Culture		
Optimized	93	45,4
Not optimized	112	54,6
Just Culture		
Optimized	91	44,4
Not optimized	114	55,6
Report Culture		
Optimized	102	49,8
Not optimized	103	50,2
Learning Culture		
Optimized	76	37,1
Not optimized	129	62,9
Total	205	100

Table 2 shows the distribution of data related to safety culture and nurses' understanding of the implementation of DM patient safety in Pekanbaru City. Of the 205 respondents, most showed a suboptimal safety culture on the variables of involvement (54.6%), fairness (55.6%), learning (62.9%), and reporting (50.2%). In addition, more than half of the nurses had a low understanding of DM patient safety implementation (56.6%).

Table 3 Outer Loading Value

No	Variabel Laten	Indikator	Outer Loading	Ket
1	Patient Safety Culture	X1.1 Informed Culture	0,873	Valid
		X1.2 Just Culture	0,956	Valid
		X1.3 Report Culture	0,888	Valid
		X1.4 Learning Culture	0,966	Valid
2	Nurse Characteristics	Z.1.1 Age	0,975	Valid
		Z.1.2 Gender	-0,990	Invalid

Z.1.3	Lama Kerja	0,990	Valid
Z.1.4	Length of Employment	-0,189	Invalid
Z.1.5	Employment Status	0,980	Valid

Table 3 validity indicators are seen from the outer loading value. If the outer loading of an indicator > 0.7 , then the indicator is said to be valid. Conversely, if the outer loading value of the indicator is < 0.7 , the indicator is said to be invalid for the nurse characteristics variable, the valid indicators are age, length of service and employment status.

**Table 4 results of composite reliability of nurse characteristics and culture
Diabetes Mellitus Patient Safety**

No	Variables	Composite Reliability	Average variance extracted (AVE)	Cronbach Alpha	Description
1	Patient Safety Culture	1,025	0,847	0,945	Reliable
2	Nurse Characteristics	0,984	0,968	0,983	Reliable

Table 4 The composite reliability value of each research variable shows a value of > 0.7 and a Cronbach Alpha value > 0.6 , so it can be said that all variables are reliable. However, the AVE value on the patient safety culture variable is > 0.5 . The AVE value illustrates the amount of variance or diversity of construct variables contained by latent variables. So it can be concluded that the construct variables in the safety culture variable can already present the latent variable.

**Table 5 Inner test results of nurse characteristics with culture
Diabetes Mellitus Patient Safety Culture**

Relationship	Original Sample	Sample Mean	Standar Deviasi	T Statistik	Description
Nurse Characteristics with Patient Safety Culture	0,184	0,192	0,060	3,065	sig

Table 5 shows the relationship between nurse characteristics and patient safety culture with a path coefficient of 0.184 and a T-statistic value of $t = 3.065$ ($t > 1.96$) indicating that the higher the nurse characteristics, the stronger the diabetes mellitus patient safety culture.

DISCUSSION

Based on the results of the study, it can be seen that the characteristics of nurses with a patient safety culture have a path coefficient value of 0.184 and a statistical t value of 3.065 ($t > 1.96$). This indicates that there is a significant relationship between the nurse characteristics variable and patient safety culture. The positive sign on the path coefficient value indicates a unidirectional relationship and can be interpreted that the higher the nurse characteristics, the stronger the patient safety culture.

The results of the PLS outer loading test show that the valid indicators of respondent characteristics are length of service, employment status and age, while the invalid indicators that cannot be indicators of respondent characteristics are gender and marital status.

This study is in line with the research of Jovanda et al, (2022) entitled implementation of patient safety culture by nurses in the inpatient room of Arifin Achmad Hospital, Riau Province. With the results of the study that as many as 37.9% of respondents had a tenure in the hospital of 6-10 years and as many as 37.9% were also in the period > 10 years. Research by Heriyati and Sinaga (2018), most nurses, as many as 36.8%, have a working period of 6-10 years. Wanda, Nursalam and Wahyudi (2020) in research stated that as many as 42% based on work experience the majority of respondents worked for > 10 years.

Length of work is often associated with perceptions of patient safety, according to Vellyana (2015) the greater the proportion of experienced professional nurses, the better the perception of patient safety so that it can prevent the occurrence of (patient safety incidents) IKP. Join Commission International (2017) states that organizations that have a strong patient safety culture are characterized by having the same perception of the importance of safety and preventive measures.

In addition, according to Cox, et al., (2006) in (Anwar, 2018) the longer they work, the skills and knowledge will increase and get a more mature job, they will also feel that they have the opportunity to get recognition and appreciation, this will make it easier to get a job and trust or authority, so they will be satisfied and have a high commitment in carrying out their daily activities.

Research with the results that respondents with permanent employment status were 101 respondents with a percentage of 85.6%. in line with studies that explain that nurses with permanent employment have a better tendency to implement a patient safety culture than nurses with contract employment status (Surahmat et al, 2019).

The results of the Literature Review (Budiana, I. 2023) entitled *The Effect of Employee Status on Nurse Performance in Health Care Facilities*, The results of the identification of several studies regarding employment status and nursing staff performance found that the majority of studies revealed an influence or relationship between employment status and nursing staff performance and there were also studies that revealed the opposite results, namely there was no effect of employment status on nursing staff performance although the number was very limited.

Nurses with permanent employment status are generally more emotionally and financially attached to the hospital or health center, so they tend to be more involved in the implementation of safety culture. Meanwhile, contract or casual workers may have lower engagement due to their limited tenure.

Yarnita's research (2019), shows that the age of respondents is more in the age group 36 - 45 years, namely 53.1%. Jovanda's research (2022), shows that of the 66 respondents, it was found that 27.3% of respondents who had a patient safety culture in the good category were in the early adulthood age range (26-35 years). The results of Mat Isa's research (2021) entitled *Impact of employee age and work experience on safety culture at workplace* did not show significant differences between age groups and employee work experience and safety compliance with organizational safety culture. Workers with an increasing number of years working and continuing to work at an older age may have implications for improving safety culture and sustainable employment. Older workers are often more reliable than younger workers and typically have a wider range of expertise, knowledge, skills and higher levels of commitment and cognitive abilities will decline with age, such as memory and response time.

A person's age affects a person's attention span and mindset. The older a person gets, the more developed his or her attention span and mindset will be, so that the knowledge he or she acquires will be better. At the age of 20-35 years, individuals will play a more active role in society and social life and make more preparations for successful adjustment to old age. and they will spend more time reading. Intellectual ability, problem solving and verbal ability are reported to have almost no decline at this age (Erdian., 2009) in (Egyita Sitepu, 2024).

(Najihah, 2018), said that the attitude of nurses in the late adult age group is related to the implementation of a patient safety culture. This is due to the increasing age of the individual will cause variations in activities, feelings, thus increasing individual needs which will affect the daily work.

The results of outer loading of the constituent indicators of safety culture are all valid indicators, namely justice, involvement, reporting and learning. 4 indicators of justice, engagement, reporting and learning are components of safety culture, Justice (Just Culture) creates a balanced environment, where mistakes are not seen as something to be punished, but analyzed and used as an opportunity for learning and improvement. This builds a culture where patient safety is more assured, the medical team feels valued, and the quality of care is

constantly evolving. Engagement (Informed Culture) is the foundation of an effective safety culture. By creating an environment where information is shared transparently and free from fear of punishment, hospitals and healthcare facilities can increase patient safety, improve medical practices, and build trust between patients and medical personnel. This culture enables early identification of potential hazards, learning from mistakes, and the development of safer and higher quality care. Reporting is an important element of an effective safety culture. By encouraging staff to report incidents, near misses, or potential risks without fear of punishment, hospitals can create a safer environment for patients and be more responsive to emerging issues. It also improves the quality of care and improves

Patient safety culture is an approach that emphasizes patient safety as an integral part of every aspect of health care. It encompasses attitudes, behaviors, policies, and practices undertaken by all medical and healthcare staff to prevent and reduce risks that could harm patients. The goal is to create a safe environment for patients by minimizing the potential for medical errors, improving communication between medical teams, and involving patients and their families in the care process (WHO, 2024).

Budaya keselamatan pasien memiliki peran penting dalam mengelola dan merawat pasien dengan diabetes melitus. Diabetes melitus merupakan penyakit kronis yang memerlukan pengelolaan jangka panjang dan dapat menyebabkan berbagai komplikasi jika tidak dikendalikan dengan baik, seperti penyakit jantung, kerusakan ginjal, dan gangguan penglihatan. Dalam konteks ini, budaya keselamatan pasien mengarah pada upaya-upaya untuk memastikan pasien diabetes mendapatkan perawatan yang tepat, aman, dan efektif guna mencegah komplikasi lebih lanjut. Dengan menciptakan dan mengembangkan budaya keselamatan pasien yang baik, pasien diabetes melitus dapat menerima perawatan yang lebih aman, dengan risiko kesalahan medis yang lebih rendah, dan hasil yang lebih baik dalam jangka panjang (WHO, 2016).

CONCLUSIONS

This study showed a significant relationship between nurse characteristics and diabetes mellitus patient safety culture. The higher the nurse characteristics, the stronger the diabetes mellitus patient safety culture. Nurse characteristics, such as length of service, employment status, and age, were also associated with the implementation of patient safety culture. However, gender and marital status showed no significant effect. Therefore, policies that strengthen ongoing training and attention to nurse characteristics such as work experience and employment status may improve the implementation of patient safety. The four indicators of safety culture, namely equity, engagement, reporting, and learning, were found to play an important role in creating a safe environment of care. This study provides important insights for the management of patient safety in healthcare facilities, with recommendations to strengthen safety culture through policies that support learning and training for nurses.

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