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# The Influence of Knowledge and Leadership on Clinical Risk Management with Patient Safety Culture as an Intervening Variable at PMI Hospital

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***Abstract.****The lack of the leadership function in monitoring and evaluation, the limited training on patient safetyis suspected to have resulted in a low safety culture and clinical risk management. This study aims to determine the influence of transformational leadership, patient safety knowledge and culture on clinical risk management at PMI Hospital. Design of a cross-sectional study, 138 nurses in August 2024. Simple random sampling technique, the independent variable is knowledge about patient safety goals and transformational leadership; the dependent variable of clinical risk management, and the intervening variable of patient safety culture. Descriptive analysis shows that PMI Hospital has nurses who have high knowledge of patient safety targets, with a charismatic leadership style, and a communicative patient safety culture. The results show that knowledge of patient safety goals, transformational leadership, and patient safety culture simultaneously and partially have a significanteffect on clinical risk management so that high knowledge, charismatic leadership, and communicative patient safety culture are proven to encourage improvements in clinical risk management at PMI Hospital.*

***Keywords****: Risk management, Patient safety, Leadership, Knowledge*

**Abstrak.**Kurangnya fungsi kepemimpinan dalam monitoring dan evaluasi, terbatasnya pelatihan tentang keselamatan pasien ditengarai mengakibatkan rendahnya budaya keselamatan dan manajemen risiko klinis. Penelitian ini bertujuan untuk mengetahui pengaruh kepemimpinan transformasional, pengetahuan dan budaya keselamatan pasien terhadap manajemen risiko klinis di Rumah Sakit PMI. Desain studi cross-sectional, 138 perawat pada bulan Agustus 2024. Teknik simple random sampling, variabel independennya adalah pengetahuan tentang tujuan keselamatan pasien dan kepemimpinan transformasional; variabel terikat manajemen risiko klinis, dan variabel intervening budaya keselamatan pasien. Analisis deskriptif menunjukkan bahwa RS PMI memiliki perawat yang memiliki pengetahuan tinggi terhadap target keselamatan pasien, dengan gaya kepemimpinan karismatik, dan budaya keselamatan pasien yang komunikatif. Hasil penelitian menunjukkan bahwa pengetahuan tentang tujuan keselamatan pasien, kepemimpinan transformasional, dan budaya keselamatan pasien secara simultan dan parsial mempunyai pengaruh yang signifikan terhadap manajemen risiko klinis sehingga pengetahuan yang tinggi, kepemimpinan karismatik, dan budaya keselamatan pasien yang komunikatif terbukti mendorong perbaikan manajemen risiko klinis di RS. Rumah Sakit PMI.

**Kata Kunci:** Manajemen risiko, Keselamatan pasien, Kepemimpinan, Pengetahuan

## 1. BACKGROUND

Over the past two decades, patient safety has become a central concern for healthcare organizations globally.Clinical risks can never be completelyeliminated (Vincent, 2006), while the risk of patient death due to preventable medical accidents is very high in developing countries.(.World Health Organization, 2014). The main locus of patient safety is in the microsystem, namely the environment where services take place, the spearhead where patient and nurse interactions occur, where safety failures occur and patients areharmed. Nurses as a whole at all levels and areas of practice have a great responsibility in reducingand if possible

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preventing the occurrence and impact of adverse events in the context where they work. (Vincent, 2010)

One way to address this challenge is the establishment of a clinical risk management system (Briner et al., 2013), because accreditation and clinical governance alone are not enough in buildingclinical risk management, what is needed is quality improvement and safe practice through the integration of effective clinical risk management into organizational processes. (Farokhzadian et al., 2014). The Indonesian Red Cross Hospital has been fully accredited for the umpteenth time in 2022, but in the initial assessment of clinical risk management at the PMI Hospital, there was no incident reporting systemin the form of a book, an incident report form in the form of an online/web-based system, an incident report form in the patient's medical record, and a weekly incident reporting review. There was no weekly assessment of incident reporting activities, while 16 incidents were obtained from2022 hospital quality committee report. The patient safety culture at the Indonesian Red Cross Hospital has not been achieved in terms of the expectations and actions of managers who support patient safety, feedback and communication regarding errors and non-punitiveresponses, there are still several quality indicators that have not been achieved in 2022, namely non- compliance of medical service officers with several actions related to patient safety goals, including identification compliance, hand washing compliance, compliance with efforts to prevent therisk of injury due to patient falls.

The purpose of this study was to analyze the influenceof nurses' knowledge of patient safety goals and transformational leadership style on clinical risk management with patient safety culture as an intervening variable in the inpatient unit of the Hospital.Indonesian Red Cross.

## 2. RESEARCH METHOD

This research was conducted withCross- sectional study design, in August 2024. Participants were registered nurses in the inpatientunit of PMI Hospital.This research protocol has been approved by the Ethics CommitteeEsa UnggulUniversity andIndonesian Red Cross Hospitaland written consent was obtained from all research participants.

### a. Data collection

Based on the analysis result of 138 respondents surveyed, most of the nurses have age limit more than 25 to 35 years (n = 138, 48%). Also, most of them have experience more than 10 to 15 years in the same hospital (n = 138, 36%) indicating that they have sufficient experience andtime to provide care to patients and work in the same environment. The sample

survey is considered appropriate to generate responses about the constructs being studied. Statistics showthat among the nurses, who responded to the questionnaire survey 79% were female. The nurses86% have D3 education as the basic qualification to work in the hospital.

We included only registered nurses becausethis study addressed a high-level nursing workdomain that typically involves only registered nurses.Nurses with less than one year of clinical experience were considered too experienced toprovide relevant information about research-related variables.

Potential participants were approached by the principal investigator or by the research facilitator attheir institution and the purpose of the study was explained. Those who met the inclusion criteria agreed to participate.

**b. Measuring instrument**

The questionnaire ascertained information onnurse demographics (gender, age, nursing education, and nursing experience), (b) clinical risk management, (c) patient safety culture, (d) knowledgeof patient safety goals, and (e) transformational leadership.

Two tools were used for clinical riskmanagement data collection, namely a structured observation checklist and a questionnaire. These checklists were developed by researchers based onliterature (Farokhzadian, 2014), includes 25 itemsto observe the current program and measurementsto develop CRM systems, such as incident reporting, and various other aspects of CRM (Table 4). This checklist is based on "yes" or "no" answers; no value answers are used, so validation is not necessary.

The questionnaire was adopted from Zabolli, 2011 Department of Health Service Management at Baqiyatallah University in Tehran, The questionnaireconsisted of 45 items divided into six sections, namely

1) knowledge, understanding and recognition of stafftowards CRM (eight questions); 2) CRM implementation status (seven questions); 3) policies and procedures (seven questions); 4) evaluation ofCRM training status (eight questions); 5) CRM position in the hospital (six questions); and 6)monitoring, analysis, evaluation and risk control status (nine questions). The questionnaire was developed based on a 4-point Likert scale. A total of 43 questionnaires were valid (r coefficient>0.3601, n=30). Its reliability was assessed using Cronbach's alpha coefficient ($\alpha$= 0.983).

Patient safety was measured using sops version 2.0 (AHRQ, 2021). This instrument consists of10 subscales and 32 items. The 10 instruments consistof (a) teamwork, (b) staffing and work rhythm, (c) organizational learning, (d) error response, (e)support from superiors and

clinical leaders, (f) error communication (g) openness of communication, (h) incident reporting, (i) management support, (j) hand-off and information exchange. 21 valid statements were obtained (coefficient r> 0.3601, n = 30) and were reliable. with Cronbach's alpha (α = 0.770).

Transformational leadership questionnaire was developed by researchers based on literature (Avolio & Bass, 2004). It consists of 37 items. The 4parts of the instrument are positive responses of transformational leadership such as (a) idealizer influence, (b) inspirational motivation, (c) intellectualstimulation, (d) individual consideration. 34 valid questionnaires were obtained (r coefficient>0.3081, n=39). Reliability was assessed using Cronbach's alpha coefficient (α= 0.935).

The patient safety target knowledge questionnaire was developed by researchers based on literature (Anderson & Krathwolh, 2001). It consists of 4 subscales and 18 items. The 4 parts of the instrument are factual, conceptual, procedural, and metacognitive knowledge. 14 items out of 34 questionnaires were valid (r coefficient>0.3081, n=39). Its reliability was assessed using Cronbach's alpha coefficient (α= 0.806).

**c. Statistical Analysis**

Data were analyzed using IBM SPSS version 18. Pearson correlation was calculated for therelationship between the main factors. Regressionanalysis helps to provide an estimate of the relationship between variables and the impact of independent variables on the outcome variables in a population. Therefore, regression analysis is used for the variables of interest. Descriptive statistical analysis on the variables of transformational leadership style and clinical risk management wascarried out through the three box method analysis(Ferdinand, 2014) to determine the condition of eachresearch instrument, the following quality ranges were formed which were divided into three qualityinterval ranges with the following calculations:

Index value:

{(F1x1)+(F2x2)+(F3x3)+(F4x4) }/4

Information :

F = Frequency of respondents who answered question items (1,2,3,4)

Upper limit = 138x4/4 = 138 Lower limit = 138x1/4 = 34.5

Analytical statistics were conducted to study the causal relationship between variables and testhypotheses systematically in this study, the analysis tools used were path analysis using independent sample t-test and analysis of variance (ANOVA).

## 3. RESULTS

### Respondent Characteristics

Based on the analysis result of 138respondents surveyed, most of the nurses have age limit more than 25 to 35 years (n = 138, 48%). Also, most of them have experience more than 10 to 15 years in the same hospital (n = 138, 36%) indicating that they have sufficient experience and time to provide care to patients and work in the sameenvironment. The sample survey is considered appropriate to generate responses about theconstructs being studied. Statistics show that among the nurses, who responded to the questionnaire survey79% were female. The nurses 86% have D3 educationas the basic qualification to work in the hospital.

**Table 1. Respondent Characteristics**

| Category | Amount | Percentage |
|---|---|---|
| Man | 30 | 21% |
| Woman | 108 | 79% |
| **Amount** | **138** | **100%** |
| **Respondents by Age** | | |
| Category | Amount | Percentage |
| < 25 Years | 30 | 21% |
| >25–35 Years | 66 | 48% |
| >35 Years | 42 | 31% |
| **Amount** | **138** | **100%** |
| **Respondents Based on Last Education** | | |
| Category | Amount | Percentage |
| D3 | 118 | 86% |
| S1 | 20 | 14% |
| **Amount** | **138** | **100%** |
| **Respondents Based on Work Period** | | |
| Category | Amount | Percentage |
| 15 years | 39 | 28% |
| >5 – 10 Years | 26 | 19% |
| **Respondents Based on Work Period** | | |
| >10–15 Years | 50 | 36% |
| >15 Years | 23 | 17% |
| **Amount** | **138** | **100%** |

### Observation Data

Table 2 describes the CRM program in the Indonesian Red Cross Hospital. Based on the 2017 McKinsey risk management model, the level of clinical risk management is at an early stage (11 of the 25 clinical risk management indicatoritems are not yet available).

**Table 2.Clinical Risk Management Assessment of PMI Hospital Bogor 2023**

| *No* | *Indicator* | *Thereis* | *There isn'tany* |
|---|---|---|---|
| *1* | *Risk management committee and team* | √ | |
| *2* | *Quality improvement committees, teams andoffices* | √ | |

| | | | |
|---|---|---|---|
| *3* | *Patient safety committee and team* | √ | |
| *4* | *Patient safety staff andofficers* | √ | |
| *5* | *Risk Manager* | √ | |
| *6* | *Educational program &cultural development (Educational program &culture building)* | | √ |
| *7* | *Management of patient complaints* | √ | |
| *8* | *Nosocomial infection control program* | √ | |
| *9* | *Adverse drug reactions(ADRs) reporting system* | | √ |
| *10* | *Safety action plan (safety action plan)* | | √ |
| *11* | *Forms of blood and blood product complications* | √ | |
| *12* | *Licensing and accreditationbody* | √ | |
| *13* | *Incident reporting form* | √ | |
| *14* | *Incident reporting is not abook* | | √ |
| *15* | *Online and web-based reporting forms* | | √ |
| *16* | *Incident report form inpatient file* | | √ |
| *17* | *Patient safety informationsystem (PSIS)* | | √ |
| *18* | *Patient safety reportingsystem (PSRS)* | | √ |
| *19* | *Review incident reports weekly* | | √ |
| *20* | *Sentinel event root cause analysis* | √ | |
| *21* | *Failure mode and effects analysis (FMEA)* | | √ |
| *22* | *Administrative medical cart* | | √ |
| *23* | *Drug packaging labeling* | √ | |
| *24* | *Individual drug distribution system* | √ | |
| *25* | *Electronic system formedication requests* | √ | |

**Descriptive statistics**

Descriptive statistical analysis using the three box method on the Clinical Risk Managementvariable The results of the analysis per indicator,the highest index is at M 2 with an index of 124.25, a high category that is in the dimension of risk management knowledge level, while the lowest is in the knowledge level dimension on indicator M1 (Every patient with long bed rest often has decubitus ulcers.) with an index of 86.20with a moderate category. The results of the analysis per dimension, the highest is in the risk management position dimension with an average index of 114.3 in the high category and the lowest dimension is the status of organizing and the status of risk management teaching with an average index of 103.7

are in the medium category.. Overall, the clinical risk management variable is in the high category because it has an average index of 107.12

Descriptive statistical analysis using the three boxmethod on the patient safety culture variable. Theresults of the analysis per indicator, the highest index is in indicator C6 (staff will remind if they find their superiors taking actions that can be risky to patient safety) with an index of 106.75 with a high category which is in the dimension of openness of communication while the lowest is in indicator A11 (staff in this room work longer in meeting the quality standards of service topatients.) the dimension of staff arrangement & work rhythm with an index of 68.25 with a low category The results of the analysis per dimension,the highest is in the dimension of openness of communication with an average index of 104.50 with a high category and the lowest dimension is in Handsoff & information exchange with an average index of 97.38 with a medium category. Overall, the patient safety culture variable is in the medium category because it has an average indexof 93.20.

Descriptive statistical analysis using the three boxmethod on the knowledge variable The results of the analysis per indicator, the highest index is in indicator P17 (index 128.5) in the high category in the conceptual knowledge dimension while the lowest is in indicator P9 (index 73) in the mediumcategory in the procedural knowledge dimension. The results of the analysis per dimension, thehighest is in the conceptual knowledge dimension (average index 116.5) with a high category while the lowest dimension is in the procedural knowledge dimension (average index 89.35. witha medium category. Overall, the knowledgevariable about patient safety targets is in the highcategory with an average index of 104.4.

Descriptive statistical analysis using the three box method on transformational leadership variables,The results of the analysis per indicator, the highest index is in indicator K11 with an index of 111.50 (high category). inspirational motivation dimension while the lowest is in indicators K28 & K35 with an index of 77 (medium category). individual consideration dimension. The results ofthe analysis per dimension, the highest is in the ideal influence/charisma dimension with an index of 104.63 (high category). and the lowest dimension is in the dimension intellectual influence with an index of 95.61 (moderate category). Overall, the transformational leadership style variable falls into the moderate category with an average indexof 78.94.

**Testing the hypothesized model**

The results of the heteroscedasticity test showed that the leadership and culture variables did not show symptoms of heteroscedasticity (Sig >0.05) while knowledge showed symptoms of heteroscedasticity Sig 0.015 (<0.05), so therespondent data was reduced, and respondents no.

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | Constant) | - 5.035 | 5.351 | | -.941 | .348 |
| | leadership | .026 | .039 | .057 | .675 | .501 |
| | knowledge | .468 | .189 | .208 | 2.475 | .015 |
| | culture | .029 | .059 | .041 | .486 | .627 |

**Table 3. Results of Heteroscedasticity Test 1a.Dependent Variable: management**

Source: Primary Data, processed with SPSS 18

The results of the heteroscedasticity test show that allvariables do not show symptoms of heteroscedasticitywith a sig. value >0.05. This means that there is no correlation between the size of the data and the residual so that if the data is enlarged it will not causethe residual (error) to be even greater, so the path analysis model is suitable for use.

**Dependent Variable: management**

**a. Path Analysis Test**

Path analysis was conducted using the multipleregression method through the SPSS version 18program to see the influence of independent 55 and 126 were selected.

**Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 56,923 | 8.104 | | 7,024 | .000 |
| | leadership | -.067 | .059 | -.097 | 1.143 | .255 |
| | knowledge | .309 | .294 | .090 | 1,052 | .295 |
| | Culture | .118 | .089 | .114 | 1,337 | .183 |

**Table 4. Results of Heteroscedasticity Test 2variables on dependent variables.**

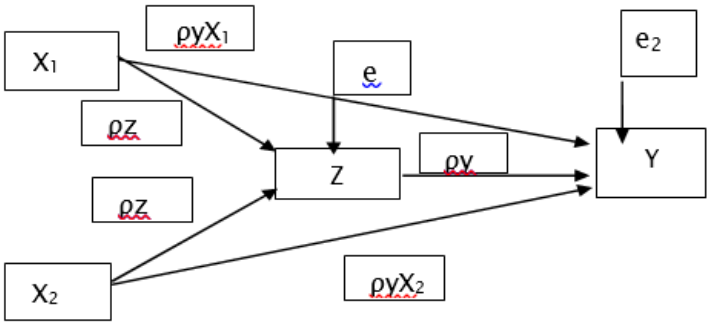


**Figure 1. Path Diagram Model of Variables X1,X2, Z and Y**

**Testing the Relationship Between Variables**

Before conducting path analysis, the author first conducted a correlation analysis to determine thenature of the relationship between each variable studied. The probability value is less than 0.05 (Sig. < 0.05) indicating that the correlation between variables is significant and the relationship between variables is directly proportional, meaning that an increase in one variable will be followed by an increase in another variable. While determining the closeness of the relationship uses criteria based on:

- $\leq \rho < 0.25$ : Very small relationship(negligible)
- $0.25 \leq \rho < 0.50$ : Quite strong relationship
- $0.50 \leq \rho < 0.75$ : Strong relationship
- $0.75 \leq \rho < 1$ : Very strong relationship

Based on all the correlation tests and significancetests conducted, the results of the correlation analysis between variables can be summarized asfollows.

**Table 5. Summary of Correlation Analysis Result**

| | coefficient of correlation i | Sig. | Natureof Relationship |
|---|---|---|---|
| X1 with X2 | .378** | .000 | Strong, Positive and Significant Enough |
| X1 with Z | .498** | .000 | Strong, Positive and Significant Enough |
| X2 with Z | .367** | .000 | Strong, Positive and Significant Enough |
| X1 with Y | .495** | .000 | Strong, Positive and Significant Enough |
| X2 with Y | .432** | .000 | Strong, Positive and Significant Enough |
| Z with Y | .603** | .000 | Strong, Positive and Significa nt and X1) |

**Source: Data Processing Results, 2024**

**The Influence of Knowledge (X1) and Transformational Leadership (X2) on Patient Safety Culture (Z)**

Structural Path Analysis Equation 1 (Z = ρzX1 +ρzX2 + ε1)

**Table 6 Structural Path Analysis Coefficients 1**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Bet a | | |
| (Constant) | 67.083 | 7.422 | | 9.039 | .000 |
| Pengetahuan | .637 | .119 | .420 | 5.339 | .000 |
| Kepemimpinan | .292 | .110 | .208 | 2.647 | .009 |

Dependent Variable: Culture Model Summary

| *Model* | *R* | *R Square* | *AdjustedR Square* | *Std. Error of the Estimate* |
|---|---|---|---|---|
| *1* | *.534* | *.285* | *.275* | *7.241* |

a. Predictors: (Constant), Leadership, Knowledge From the table of coefficients of structural pathanalysis 1 above, we get:

a.Standardized β (X1-Z); ρzX1 = 0.420b.Standardized β (X2-Z); ρzX2= 0.208

c. Residual coefficient (e1) = 1- R2 = 1 – 0.285 =0.715 So the equation of structural path 1 is: Z = ρzX1 + ρzX2 + e1

Safety culture = .420 Knowledge + .208 Leadership + .715The model summary table above obtained one path analysis model with a determination coefficient value (Adjusted RSquare) of 0.275. This shows that by using the path analysis model obtained, the nurse's knowledge variable about patient safety targets (X1) and transformational leadership style (X2) have an influence on changesin the patient safety culture variable.

(Z) . The Influence of Knowledge (X1), Transformational Leadership Style (X2) and Patient Safety Culture (Z) on Clinical Risk Management (Y)

C. Structural Path Analysis Equation 2 (Y = ρyX1+ ρyX2 + ρyZ + e2)

**Table 7. Structural Path Analysis Coefficients 2**

a. Dependent Variable: MRK

Model Summary

| *Model* | *R* | *R Square* | *djusted R Square* | *Std. Erro r of the Estim ate* |
|---|---|---|---|---|
| *1* | *.668* | *.446* | *.434* | *11,533* |

a. Predictors: (Constant), Culture, Leadership,Knowledge

From the table of coefficients of the structural pathanalysis 2 above, we get:

*a.* Standardized β (X1-Y); ρyX1 = 0.208

*b.* Standardized β (X2-Y); ρyX2 = 0.197

*c.* Standardized β(Z-Y); ρyZ = 0.427

*d.* Residual coefficient (e2) = 1- R2 = 1 – 0.446 =0.554

So the equation of the 2 structural paths is:

Y = ρyX1 + ρyX2 + ρyZ + e2 Clinical risk management = 0.208 Knowledge + 0.197 Leadership + 0.427 Culture + e2

The summary model table above obtained one pathanalysis model with a determination coefficient value (Adjusted RSquare) of 0.446. This shows that by using the path analysis model obtained where the nurse's knowledge variable about patient safety targets (X1), transformational leadership style (X2), and patient safety culture (Z) have an influence on changes in the Clinical Risk

| Model | Unstand St ardized Coeffici ents | | anda rdized Coeffi cients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant ) | -11,139 | 14,976 | | -.744 | .458 |
| Knowledg e | .569 | .209 | .208 | 2,721 | .007 |
| Leadershi p | .498 | .180 | .197 | 2,763 | .007 |
| Culture | .770 | .137 | .427 | 5.618 | .000 |

Management variable (Y) of 0.446.

The effect of error on equations 1 and 2 is as follows: Pe1 =1- R2 = 1 – 0.285 = 0.715;

Pe2 =1-

R2 = 1 – 0.446 = 0.554

Rm2 = 1- (Pe1)2(Pe2 )2 = 1 - (0.715)2 (0.446)2 =1-(0.511x0.198)=0.890

The validity examination of the model through the total determination coefficient (Rm2) shows a value of 0.89. So, the total data diversity that can be explained by the model is 0.89.

Influence Calculation

The Influence of Nurses' Knowledge of PatientSafety Goals (X1) on Clinical Risk Management (Y)

*a.* Direct Effect: PL(X1-Y)=ρyX1 = 0.208 ,sig 0.007

*b.* Indirect Influence:

PTL (X1-Y)= (ρzX1) x (ρyZ)= 0.420 x0.427=0.18

a. Total Effect(X1-Y)= PL(X1-Y) + PTL(X1-Y)=5.52+12=17.52%

The Influence of Transformational Leadership Style (X2) on Clinical Risk Management (Y)

*a.* Direct Effect: PL(X2-Y)= ρyX2 = 0.197,sig 0 . 0 0 7

*b.* Indirect Influence:

PTL (X2-Y) = (ρzX2) x (ρyZ)= 0.208 x 0.427=0.089

a. Total Effect(X2-Y)= PL(X2-Y) + PTL(X2-Y)=0.197+0.089=0.285

## 4. DISCUSSION

### a. significant influence of Nurses' Knowledge of Patient Safety Goals (X1), Transformational Leadership Style (X2) and Patient Safety Culture

(Z) simultaneously on Clinical Risk Management (Y) Clinical Risk Management (Y) is influenced by knowledge of patient safety targets (X1) and transformational leadership (X2) and patient safety culture (Z) simultaneously andsignificantly.

The results of the analysis concluded that knowledge of patient safety targets, transformational leadership style, and patient safety culture simultaneously had a significant effect on clinical risk management. In this study, itcan be interpreted that simultaneously high nurse knowledge of patient safety targets, charismatic transformational leadership in the inpatient ward,and communicative patient safety culture influenced a change in clinical risk management.

Several studies have shown the influence of safety culture. and decision-making capacity havea direct effect on patient safety and transformational leadership style can build a nursing work environment that promotes professional nursing practice, thereby encouraging better patient outcomesTangatarova, S., & Gao, Y. (2021). Also as reported in the study by Okafor et al (2015), lack of attention from owners or management, burdensome reporting processes and fear of responsibility and shame are factors causing low incident reporting. So from this study it can be concluded that leadership and reporting systems which are elements that build patient safety culture have an effect on hospital clinical risk management. From the study of Okafor et al, 2015also stated that the frequency of error reporting can be increased dramatically by using a web- based reporting system, which is easy to use, voluntary, non-punitive system, transparent and conducts incident reviews transparently and decentralized. In this case, there is no reporting system and web-based incident reporting formwhich is one of the elements that builds clinical risk management at PMI Hospital.

The results of the descriptive analysis of clinical risk management at PMI Hospital show that nurses have understood risk management. Anunderstanding of the organization of clinical risk management has also been formed, but anunderstanding of the position of clinical risk management and supervision in the evaluation, assessment and control of risk in the hospital has not yet been fully formed. The position of risk management that assesses the importance of regulations, guidelines and budget allocations that support clinical risk management activities is necessary in building the maturity of clinical risk management, including the existence of supervisory activities in the evaluation, assessment and control of risks in hospitals. Based on the division of the three phases of the evolution of the risk management model/risk management model byMcKinsey, 2017, the level of clinical risk management maturity of PMI Hospital is still in the initial phase, namely the phase of building basic elements, especially regarding preparingbasic infrastructure.

**b. The Influence of Nurse Knowledge on Objectives Patient Safety (X1) Against Patient Safety Culture (Z)**

The results of the analysis concluded thatknowledge of patient safety targets has a significant influence on patient safety culture.

This is in line with the study of The GermanCoalition for Patient Safety, 2017 which states that a safety culture can be developed and built from a constant learning process. The Institute ofMedicine of the National Academies, 2004 also stated that a safety culture requires organizational understanding and knowledge andskills as an important foundation for safe

practice. And at the individual level Van der Schaaf (1992) stated that organizational learning can be improved through staff education and learning. A study by Bahrami MA, 2014 in Iran also proved that a patient safety culture at the organizational level can be built and developed from a constant learning process and this can be achieved through education and learning at the individual or staff level.

In this study, the results of the descriptive analysisshowed that nurses have known and understood the patient safety targets, this is the result of the implementation of education and training on patient safety targets which are carried out everyyear at PMI Hospital. So that nurses' knowledge of high patient safety targets influences the achievement of a communicative safety culture inthe inpatient service environment of PMI Hospital.

**c. The Influence of Patient Safety Culture (Z) on Clinical Risk Management (Y)**

The results of the analysis concluded that patient safety culture has a significant influence on clinical risk management.

This is in line with the study of The GermanPatient Safety Coalition, 2017 stating that one of the requirements of a clinical risk management system in a hospital is to build a positive safety culture. A study by Olii et al, 2019 in the journal of maritime public health revealed that accreditation is one of five factors identified as influencing the implementation of clinical risk management. And PMI Hospital is known to havethe status of a fully accredited hospital. However,there is a study by Farokhzadian et al, 2014 whichrevealed that accreditation and clinicalgovernance are not enough in building clinical risk management, and this is in line with the results of research by Yasmi and Thabrany, 2015which stated that the patient safety culture atKarya Bhakti Pratiwi Hospital Bogor was provento be lacking even though the hospital had been accredited.

So that a communicative patient safety culture influences the increase in the level of clinical riskmanagement establishment of PMI Hospitalwhich is still at the basic level or in the initial/formation phase.

**d. The Influence of Nurses' Knowledge of Patient Safety Objectives (X1) on ManagementClinical Risk (Y)**

The results of the analysis concluded that nurses'knowledge of patient safety targets has a significant influence on clinical risk management.This is in linewith a study by Leotsakos A et al., 2014 in the journal of multidisciplinary healthcare, which states that it is very important to build patient safety education for healthcare professionals to gain an

understanding of therisks in service. The results of a study by Adibi etal, 2012 in the journal of diabetes and metabolic disorders, stated that the establishment of an effective clinical risk management system requires adequate staff education. Saud et al,2021 in the journal of health, education and literacy stated that the continuing education factor is one of the key factors in the implementation of risk management, especially medical records. A study by Olii et al, 2019 in thejournal of maritime public health stated that staffeducation is one of the factors that has beensuccessfully identified and has a positive tendencytowards the implementation of clinical riskmanagement.

Knowledge of high patient safety targets can improve the status of clinical risk management inPMI hospitals that are at the basic level or in theinitial/establishment phase of clinical risk management.

**e. The Influence of Transformational Leadership Style(X2) on Patient Safety Culture (Z)**

The results of the analysis concluded that transformational leadership style has a significantinfluence on clinical risk management.

This is in line with a study by Nivalinda et al, 2013in the journal of nursing management which found that there was an influence of the leadership style of the head of the room on the implementation of patient safety culture. A study by Bahrami et al, 2014 revealed that there was a factor causing the weakness of patient safety culture in teaching hospitals, namely the lack of integrated policies due to policy-making factors and managerial initiatives in the system. A study by Habibi et al, 2017 in the Iranian Red CrescentMedical Journal stated that the largest dimensionof the problem of patient safety culture in Iran compared to Turkey and the United States was atthe managerial level. Rizkia D. et al, 2022 in the journal of accounting and business economic applications found that interprofessional collaboration and transformational leadership had a positive and significant effect on work motivation and patient safety. Mistry, et al, 2020 in the Indian Journal of Forensic Medicine and Toxicology stated that there was a very strong relationship between transformational leadershipand patient safety. Seljemo et al, 2020 in BMC Health Services Research, stated that transformational leadership style is an importantfactor in efforts to create and maintain a good patient safety culture in nursing homes.With charismatic transformational leadership at PMI Hospital, a high level of patient safety culture will be built in the hospital.

**f. The Influence of Transformational Leadership Style (X2) on Management Clinical Risk (Y)**

The results of the analysis concluded that transformational leadership style has a significant influence on clinical risk management.This is in line with a study by Olii et al, 2019 in the maritime public health journal stating that leadership is one of the factors that has been successfully identified and has a positive tendencytowards the implementation of clinical risk management. Dehnavieh et al, 2013 in. International Journal of Hospital Research, revealed that inefficient leadership is one of the factors that affects the establishment of hospital clinical risk management. Okafor et al (2015) revealed that the lack of attention from owners or management is one of the factors causing low incident reporting so that from this study it can beconcluded that leadership is related to hospital clinical risk management, especially those relatedto the reporting system.

Through charismatic leadership, it will build and increase the level of clinical risk anagement stability at PMI Hospital from the basic/non- implementative level to the implementative level.

## 5. CONCLUSION

Based on the entire series of analysis results and discussions, the following conclusions canbe drawn:

1. Knowledge of patient safety targets, transformational leadership style, and patient safety culture simultaneously have a significant influence on clinical risk management so that increasing knowledge of patient safety targets, fulfilling transformational leadership style, and forming a patient safety culture simultaneously will encourage an increase in the level of clinical risk management stability at PMI Bogor Hospital.
2. Knowledge of patient safety targets has a significant influence on patient safety culture, so that increasing nurses' knowledge of patient safety targets will encourage the formation and strengthening of a patient safety culture at PMI Bogor Hospital.
3. Patient safety cultureinfluential and significant towards clinical risk management so that by ensuring the formation of a patient safety culture it will be able to encourage changes in the level of maturity of clinical risk management at PMI Bogor Hospital.
4. Nurses' knowledge of patient safety targets has a significant influence on clinicalrisk management, so that by increasing nurses' knowledge of patient safety targets, they will be able to build clinical risk management at PMI Bogor Hospital.
5. Transformational leadership style has a significant influence on clinical risk

management so that transformationalleadership will be able to increase the level of clinical risk management at PMI Bogor Hospital.

6. Transformational leadership style has an influence and is significant to clinical risk management. So with transformational leadership, it will strengthen the patient safety culture of PMI Bogor Hospital.

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