Factors affecting patient safety culture in the nursing section of a type C private hospital in Surakarta using structural equation modeling

Lobes Herdiman**, Susy Susmartini†, Dewani Asmara Sekartaji Pangau‡, I Gusti Ngurah Priambadi

ABSTRACT

**Introduction:** Patient safety culture is a high-quality health service that must be owned by all hospital staff, specifically for type C private hospitals. Therefore, this research selected seven factors influencing patient safety culture and made operational definitions based on references from preliminary research. The indicators used refer to Patient Safety Management Activities (PSMA) based on the International Patient Safety Goals (IPSG) principles regulated by the Minister of Health Regulation 11 of 2017. This research aims to identify hospital elements related to implementing a patient safety culture. It includes individuals, working conditions, work environment, management, awareness related to safety, safety culture, and PSMA.

*Methods:* Data were collected from 215 respondents through independent questionnaires distributed online to two type C private hospitals in Surakarta City, where 160 nurses work in in-patient rooms and 55 nurses in the Emergency Room (ER). Data collected were analyzed using structural equation modeling (SEM), such as SmartPLS 3.0, to determine the relationship between seven factors: individual, working conditions, work environment, management, safety awareness, culture, and PSMA.

**Result:** SEM test results in Factors affecting PSMA on the SEM test with a p-significant value of 0.05. A significant direct positive effect on PSMA is the factor of safety culture and work environment. Meanwhile, the indirect significant positive influence on PSMA comprises individual conditions, management, and safety-related awareness factors through safety culture factors. The process of not having a significant direct effect on PSMA is working conditions and safety-related awareness factors.

**Conclusion:** The involvement of all parties with active roles in every healthcare system is expected to increase a safety culture which can then influence the increase in PSMA.

**Keywords:** Nurses, Private Hospital, Patient Safety Culture, Safety Management, SEM.


INTRODUCTION

Patient safety culture is a fundamental aspect of humanity, specifically in the health sector, and must be considered before engaging in any hospital activity. According to the World Health Organization (WHO), OECD, and the World Bank, quality health services must be timely, equitable, effective, safe, integrated, efficient, and human-centered. Health services aim to prevent or reduce Patient Safety Incidents (PSI), including all errors, mistakes, and accidents that occur in hospitals, regardless of whether they are harmful. PSI consists of unexpected occurrences, near misses, none, and potential injurious events (Permenkes RI. No.1691/MENKES/PER/VIII/2011 concerning hospital patient safety). Unsafe patient care is among the top ten causes of death and disability. In low- and middle-income countries (LMICs), approximately 134 million adverse events occur annually due to unsafe hospital care practices. The causes of unsafe treatment are a significant concern in patient safety culture because of its harmful effect.

In LMICs, relatively 134 million adverse events occur annually due to unsafe treatment in hospitals, resulting in 2.6 million deaths. The Indonesian National Patient Safety Committee (INPSC) stated that the number of related accidents increased. For example, from 2015 to 2019, as many as 289, 668, 1647, 1489, and 7465 reports were received, respectively. However, due to this trend, in 2019, the World Health Assembly (WHA) and the 72. policy-making bodies under WHO ratified the Global Action for Patient Safety. The WHA urges Member States to work closely with civil societies, professional bodies, organizations, academic and research institutions, industries, and other relevant stakeholders to promote, prioritize, and embrace patient safety culture, related policies, and strategies at all healthcare levels.

They further urged establishing systems for the involvement and empowerment of patients, families, and communities, specifically those affected by an adverse event. These include delivering safer
healthcare services, such as capacity-building initiatives, networks, and associations. These Member States were promoted to work with the civil societies, using their experiences positively and adopting harm minimization strategies, compensation mechanisms, and schemes to instill safety measures in the health sector. The movement to improve patient safety culture around the world is to guarantee quality services in private hospitals, specifically those in developing countries such as Indonesia. Patient safety culture is an important issue due to the several findings on medical error cases reported in several provinces. Herkutanto, in research, said that as many as 91% and 15% of public and private hospitals do not have a medical committee. Irrespective of the fact that the role of the medical committee in ensuring patient safety culture is crucial, specifically in type C private hospitals.11

Type C private hospitals in Surakarta City have implemented Patient Safety Management Activities (PSMA). However, the impact of these regulations on patient safety culture still needs to be conveyed and explained to all staff. This culture is defined as the values, attitudes, perceptions, competencies, and individual and group behavioral patterns that determine the workers’ commitment, style, organizational health, and safety management skills.12,13 Its indicators are associated with a survey on type C private hospitals in Surakarta City. This assessment refers to the PSMA standard centered on the six principles of the International Patient Safety Goals (IPSG)14, monitored by the Minister of Health regulation number 11 of 2017.15

The PSMA standard includes identifying the right patient, increasing effective communication, improving the safety of drugs, ensuring safe operations, and reducing the risk of infections and injuries due to falls.15 Doctors, nurses, and hospital administrators try to avoid accidents as much as possible.16 Therefore, the factors that affect patient safety are engineered by humans and a systematic approach.17 An empirical research designed a patient safety model to guide against related medical errors. The “Swiss cheese” model was first introduced by James, who is well-known in the patient safety community.18 The reason for this model was that Charles et al.19 used the James model in their research to explain seven factors that influence clinical practice. These include organizational and management aspects, work environment, team, tasks, and patient characteristics. Finally, the development of models in recent years has emphasized the System Engineering Initiative for Patient Safety (SEIPS).20

According to the SEIPS model, most inefficiencies and errors are caused by human factors and work systems that affect the patient’s nursing process. The work system describes the job functions of the physicians, health professionals, other staff, and care teams, including the patients and their caregivers. It is defined into five components: people, tasks, tools and technology, physical environment, and organizational conditions, which interact and influence each other.21 Clarifying the ‘patient’ at the center of the work system is another conceptual evolution of the SEIPS model that tends to influence nursing outcomes such as PSMA. Pascale et al.20 and Pascale21, in their published research results on health professionals in central work systems, suggest that there are other ways to conceptualize people, either as a team or as patients.22

More research on patient safety culture has been conducted to determine the factors influencing PSMA. These factors are classified into systems, human interaction, environment, equipment, personal, accident, patient safety culture, and awareness.23,24,25 Research on patient safety culture has been conducted in Korea under specific topics. It includes the healthcare providers’ perception of patient safety culture and its management. Based on this research, the factors that influence PSMA activities are divided into individual (age, work experience, position, working hours per week, patient’s educational experience, etc.) and organizational (patient safety culture, conducive climate, leadership type). Corporate communication is described as the collaboration between doctors and nurses, etc.26 Therefore, must investigate patient safety in type C private hospitals. The factors influencing hospital decisions in providing related services also need to be identified.

They carried out the patient safety assessment by distributing periodic surveys to ascertain the atmosphere in the hospital. It is the role of the hospital committee to predict the attention given to the management of the patient safety culture.27 In some type C private hospitals in Surakarta City, patient safety culture is part of a community service initiative investigated to identify promising interventions for improvement. It is also realized by considering certain hierarchies at each organizational level, such as a clear mission statement, internal patient safety workshops, or the workload of the nursing staff, who are always at the forefront. Therefore, this research is aimed to determine the factors that influence patient safety culture in the nursing department using the structural equation model (SEM) analysis. The survey and acquired data were completed using the SEIPS and partial least square-structural equation models (PLS-SEM) alongside the SmartPLS. This analysis predicts the relationship between constructs and latent variables and validates the proposed theory. This research provides valuable information to improve PSMA and nursing care quality.

The first hypothesis proposed states that the management factors of patient safety culture have a significant and indirect positive effect on PSMA achievement. The second hypothesis states that the safety-related awareness factor significantly and indirectly positively affects PSMA achievement. This present research aims to identify hospital elements related to patient safety culture. It includes the seven factors: individual, working conditions, work environment, management, awareness related to safety, safety culture, and PSMA.

METHODS

Methods

A survey was carried out in 2021 by distributing questionnaires at two type C private hospitals in Surakarta City, as shown in Figure 1.

The first attempt was to understand the activities related to hospital patient safety culture. It also aims to determine
which departments allowed their staff to participate in this research. The second attempt was to measure patient safety culture in hospitals. In addition, both surveys or attempts were carried out online, while the respondents completed the questionnaire using an Android mobile phone. This present research is expected to serve as a reference in implementing efforts to improve the quality of health services. It still does not rule out that some defects are used as suggestions to improve the performance of Type C Hospitals in Surakarta City.

Participant

These respondents stated they were satisfied with the submitted informed consent process, and most considered themselves well-informed. This research is not clinical and does not pose a risk to the health or safety of the respondents physically or mentally. This study emphasizes a survey using a cross-sectional design regarding patient safety culture in type C private hospitals in Surakarta City. The first survey was conducted on staff responsible for patient safety management in three types of C private hospitals. These respondents were selected through stratified random sampling according to their position. To reduce the occurrence of confounding factors, the selected hospitals have a minimum of 100 beds following the Regulation of the Minister of Health of Indonesia No. 3 of 2020 concerning Hospital Classification and Licensing and electronic medical record systems. In the second survey, questionnaires were distributed to 160 nurses and 55 of them working in in-patient and emergency rooms, respectively, and specifically selected patient safety managers at each hospital. The distribution of questionnaires reflects the percentage of medical professionals in the hospital. However, through the hospital policy, the questionnaires were distributed evenly to the selected staff based on their position, years of experience, and level of involvement in patient safety activities.

Questionnaire

The first survey focused on questions about the demographic factors of each hospital, such as the number of beds, average length of stay, description of the patient safety mission statement, and accreditation status by Komisi Akreditasi Rumah Sakit (KARS) for quality health services. The second was centered on patient safety warnings, participating in internal patient safety workshops, working hours per week, number of night shifts per month, number of days off per month, and patient safety culture, and patient safety culture and measured the questionnaire with a Likert scale from one to five (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral or Doubtful, 4 = Agree, 5 = Strongly Agree) with answer choices that include individual, working, work environment, management, awareness related to safety, safety culture and PSMA conditions of 4, 2, 3, 3, 8 and 8 points, respectively.

Data Collection

Primary data collection was carried out by distributing structured questionnaires. These were distributed online by the hospital’s Education and Training section for four weeks, from 30 November to 30 December 2021. The total number of respondents was 215 from two type C private hospitals in Surakarta City. The aims and objectives of this present research, including the data collection methods, were explained to the heads of the Department of Nursing before they were asked to participate. Eligible participants were selected based on the inclusion criteria. They were asked to complete a consent form, and the investigators collected the signed ones after four weeks. An institutional review committee provided ethical approval, and all participants were made to sign a written consent before filling out the questionnaire. The Ethics Committee of Universitas Sebelas Maret Surakarta approves this research.

The collected data were analyzed using SmartPLS and descriptive statistics to evaluate the participants’ general
characteristics and the measured variables. Took out an evaluation of the outer model to find out the relationship between latent variables and their indicators. The four measurement parameters are convergent, discriminant validity, extracted average variance, and composite reliability. The correlation between variables is calculated by looking at the values of the R-square, Q^2, and Goodness of Fit (GoF) tests. In contrast, the significance level was evaluated using the p-value realized with the bootstrapping method. Assuming a p-value and t ≥ t-table of 0.5 and 1.96 were obtained, we can conclude that the result is significant or the H1 hypothesis is accepted and vice versa.

**Data Analysis**
The collected data were analyzed using Microsoft Excel and SmartPLS, using descriptive statistics to decipher the respondents’ characteristics and measured variables, evaluated the outer model to determine the relationship between latent variables and their indicators. In addition, it also defined how each indicator relates to its latent variables. The four measurement criteria were realized using SmartPLS to assess the model, which consists of (a) convergent, and (b) discriminant validity,

### Table 1. Respondents’ characteristics.

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### Table 2. Second iteration discriminant validity.

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Measurements

This study uses the SEIPS model by adopting the research report model by Hyeon-Hee and Soukyoung based on PSMA. Some of the questions in the questionnaire assume questions from the Hospital Survey on Patient Safety Culture (HSOPSC). The variables measured in this study are as follows:
1. Individual Condition (IC)
   Work experience, skills, fatigue, and frustration were measured as the individual condition. This attribute comprises four items, which were measured, although deleted one of them (IC) was due to its low reliability. In addition, Cronbach’s α used in the present research is 0.815.

2. Working Condition (WC)
   Job autonomy and demand were measured as the working conditions. Job autonomy means substantial freedom, independence, and individual discretion in scheduling work and determining the completion procedures. However, job demand refers to time constraints, increased workload, downtime, and responsibilities. In this research, job autonomy and order served as a measurement form, and Cronbach’s α was 0.733.

3. Working Environment (WE)
   Facilities in the workplace design were measured as the working environment. This factor measures the completeness and effectiveness of the hospital facilities and workplace design. Meanwhile, Cronbach’s α used in this analysis was 0.772.

4. Management (M)
   Staffing and Working Procedures were measured as management, affecting the practical work process, including the human resource policies. This research further analyzed organizational support and employee attitudes. The management was classified into staffing and analyzed working procedures. Staffing refers to the appropriate number of staff needed to promote the safety of both patients and nurses in each department. The operational system means proper practices that are in place to promote patient safety. Furthermore, Cronbach’s α used in this analysis was 0.775.

5. Safety-Related Awareness (SRW)
   Safety-related awareness refers to the respondents’ behavior in terms of understanding, evaluating, remembering, and controlling patient safety. Self-efficacy, safety controls, and knowledge encompass safety-related awareness. Self-efficacy means belief in one’s capacity to organize and perform the necessary activities to accomplish a particular job. Safety control and knowledge refer to personal cognitive abilities and adequate patient safety information. In addition, Cronbach’s α used in the analysis was 0.708.
6. Safety Culture (SC)
Safety culture refers to personal and group values, attitudes, circumstances, capacities, and behavioral patterns to determine an organization’s health and safety management. This attribute was measured using the questionnaire developed by WHO, which consisted of eight sub-areas. Safety culture was also measured by teamwork, supervisor expectation, action promoting patient safety, organizational learning management support, feedback and communication centered on error, openness, nonpunitive response, and frequency of reported events. Meanwhile, the four items (O2, O4, O6, O8) deleted low reliability, and Cronbach’s α was 0.775.

7. Patient Safety Management Activities (PSMA)
PSMA refers to activities that prevent all kinds of errors and accidents likely to occur while providing health services. It was measured by the Joint Commission International (JCI) based on the six international patient safety goals. In addition, Cronbach’s α used in the analysis was 0.844.

RESULTS

Conceptual Framework
This present research adopted an SEM based on the SEIPS model. The inclusion of references was adapted from the investigation by Richard and Pascale, Hyeon-Hee and Soukyoung. Carayon, in his study, reported that most of the errors were caused by individuals and inadequate work systems, which ultimately affected the outcome of the entire process. Models Hyeon-Hee and Soukyoung in their research, show that individual working conditions, organizational support, safety-related recognition, and patient safety culture are important factors affecting PSMA. They then included these variables in the formation of this research model. Katarzyna et al., in their study, reported that the addition of the work environment affected the results of the process, where the variables modeled had an impact on patient safety culture and PSMA, as shown in Figure 2.

Participant Characteristics
The participants’ characteristics are shown in Table 1. However, 69% of participants were women, with 25%, 69%, and 7% younger than 29, within 30 to 44 years, and older than 45, respectively. Regarding the educational level, 100% were high-education graduates, 74% from the Emergency Department, and 26% from the Inpatient Department. For work experience, 29.8%, 28.3%, and 21.6% had

Table 5. Inner model test result.

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<th>Variable</th>
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<th>Q²</th>
<th>GoF</th>
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<td>Safety Related Awareness</td>
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Table 6. Estimates and effects of the model.

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<th>Indirect Effect</th>
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Figure 3. Bootstrapping results of the patient safety culture model at type C private hospitals in Surakarta City.
more than 10 years, 5 to 10 years, and 1 to < 3 years of experience, respectively.

Validation and Analysis of the PSMA Nurse Structural Model

1. Evaluation of the Outer Model
   They used three measurement parameters to determine the relationship between latent variables and their indicators: discriminant, convergent validity, and internal consistency reliability. The first iteration’s discriminant validity shows several indicators are IC1, O2, O4, O6, and O8, with a loading factor value of less than 0.5. Therefore, it eliminated the testing of the second iteration. Table 2 shows that all indicators met the requirements of the second iteration, thereby leading to the conduction of the subsequent evaluation stage.
   The next stage is the convergent validity test, where the AVE value is more significant than 0.5. Table 3 shows that all variables in this research are acceptable because they have an AVE value > 0.5. Therefore, they are convergently valid. The subsequent stage is the conduction of the internal consistency reliability test, which led to the realization of a Cronbach’s α value greater than 0.7. Table 4 shows that all the variables are acceptable because they had a Cronbach’s α value > 0.7. It also shows that the instruments used were highly consistent and stable. In other words, all the constructs or variables served as ideal measuring tools. Every question used to measure each construct had good reliability.

2. Evaluation of the Inner Model
   The inner model displays the relationship between the constructs. Table 5 shows the values of the R-square, Q², and GoF tests for PSMA, safety culture, and safety-related awareness. R-square determines how much the independent variable influences the dependent one. The R-square values of 0.67, 0.33, and 0.19 show that the model is robust, moderate, and weak, respectively. The R-square value for PSMA shows that the four constructs have an influence of 30.9% and are reasonable. The R-square value for safety culture shows that the four constructs have a result of 63.9% and are stated to be strong. Meanwhile, the R-square value for safety-related awareness depicts that the three constructs have an influence of 18.9% and are said to be weak.
   The Q² test aims to determine the accuracy of the observed value. The assumption of Q² > 0 and Q² < 0 indicates the model has predictive and lacks predictive relevance, respectively. Table 5 shows that the exogenous construct has great predictive relevance than the endogenous one. To evaluate the overall structural and measurement model, conducted a GoF assessment to validate the combined performance of the outer and inner models. A value of 0.515 was obtained, equivalent to a large GoF greater than 0.38.

3. Hypothetical Model Analysis
   Hypothetical model analysis was carried out to determine whether the independent variables significantly affect the dependent ones. The direction of the relationship between variables (positive or negative) was analyzed using path coefficients. In contrast, the significance level is further evaluated with the p-value obtained using the bootstrapping method. Figure 2 shows the bootstrapping results of the PSMA model in type C private hospitals in Surakarta City. Table 6 shows the total effect of the hypothetical model. The working environment significantly and directly influences PSMA. Meanwhile, safety culture is indirectly affected by individual conditions and the working environment.
   PSMA significantly positively affected individual conditions, working environment, and safety culture. Moreover, safety culture was greatly and directly influenced by individual conditions, management, and the working environment. The individual condition significantly and indirectly influenced safety-related awareness. It also directly affected the individual and working conditions.
   The hypothesis testing results showed that 5 out of 11 were accepted, while the remaining six were rejected. Previous research stated that rejected several hypotheses due to differences in the hospital situation. It used the following indicators to measure individual conditions: work experience, skills, fatigue, and frustration. The SEM test showed that the individual condition factor had a direct and significant positive effect on safety-related awareness. It also had both direct and indirect influences on the safety culture factor. The individual condition indirectly and significantly positively impacted PSMA, which was determined through the safety culture factor. Furthermore, the safety-related awareness factor did not significantly and indirectly affect PSMA. Facilities associated with the workplace design serve as indicators to measure the working environment. The SEM test showed that the working environment positively and directly affects safety culture. Staffing and working procedures are indicators used to measure management factors. The SEM test results showed that the management factor does not have a significant positive or indirect influence on safety-related awareness. Furthermore, it showed a direct and significant positive effect on the safety culture. The management factor also had an absolute outcome, indicating a significant positive impact on safety culture.
   The following indicators, self-efficacy, safety control, and knowledge, measure the safety-related awareness factor. The SEM test showed that safety-related awareness positively and directly affects safety culture. An improved patient safety culture improves self-efficacy, control, and knowledge. Safety culture is measured by teamwork, supervisor’s expectations and actions, organizational learning, management support for patient safety, feedback and communication about errors, and openness. Others include nonpunitive responses to mistakes, including frequency of reported events. The test results indicated that the safety culture factor directly, significantly, and positively affects PSMA.
DISCUSSION

The SEM used the SEIPS model as a reference to explain its contributions to work systems, patient nursing processes, and outcomes. This model’s inclusion adopted the research results by Richard and Pascale, Hyeon-Hee1 and Soukyoung. The individual working conditions, work environment, and management variables were adapted as functional systems. The variables safety-related awareness and safety culture was adapted as patient nursing processes. The management’s activities are also an outcome of the nursing process. These were used to test the SEM model, realized with PLS-SEM and SmartPLS 3.0 software. The management activities depend on three evaluation stages: assessing the outer and inner models and testing the hypothesis.

Incidentally, the evaluation of the outer model was carried out twice. In the first iteration, several indicators failed to meet the relevant requirements, namely IC1, O2, O4, and O6, while removed the O8 indicators in the second iteration. The results of the second iteration outer model showed that the following indicators IC2, IC3, IC4, M1, M2, WC1, WC2, WE1, WE2, N1, N2, N3, O1, O3, O5, and O7 tend to accurately, consistently, and precisely measure the variables and has met the requirements to proceed to the inner model evaluation stage. The evaluation of the inner model showed that the exogenous variables have great predictive relevance for the endogenous ones. The management activities, safety culture, and safety-related awareness had a moderate (30.9%), strong (63.9%), and weak (18.9%) influence on the exogenous variables, respectively.

Overall, the proposed model is considered valid with a GoF value of 0.515, categorized as significant. The greater the GoF value, the more appropriate the model depiction. The test results showed that 3 of the 11 hypotheses were accepted, while the remaining seven were rejected. It was due to differences in the hospital characteristics as the object of this study and the object used in the research by Katarzyna et al. and Hyeon-Hee1 and Soukyoung. No response pattern was observed, and it followed the outlier labeling rules. It is because no skewness or kurtosis was higher than one; therefore, the data are expected.

The indicators of individual conditions include work experience, skill, fatigue, and frustration. The SEM test showed that this factor directly and significantly positively affects safety-related awareness. Hyeon-Hee1 and Soukyoung, in their research, reported that the longer the work experience, the lesser the fatigue level, and the better the nurse’s mood and skills, self-efficacy, knowledge, control, and safety awareness. Nurses with vast work experience have increased knowledge, sense of power, and self-efficacy by participating in PSI preventive education or training.

The individual condition has a significant positive effect alongside the direct and indirect impact on safety culture. Contrary to the research conducted by Hyeon-Hee1 and Soukyoung, their study reported that nurses with work experience are slightly more careful and pay attention to safety culture. These factors are still adapting to a new work environment and limited experience. The SEM test results at Type C Hospital and as the object of this research indicated that nurses with long working experience show more care. It is because they have a sense of responsibility, such as leading an exemplary life for the new nurses to emulate and tend to be more careful. Moreover, they have been subjected to various PSIs in the hospital environment.

The individual condition factor has a significant positive, direct, and indirect effect on the safety culture. It contradicts research by Hyeon-Hee1 and Soukyoung reporting that newly recruited nurses are slightly more careful and pay attention to safety culture because they are still trying to adapt to the new work environment. The SEM test results at Type C Hospital indicated that nurses with extended work experience show more care because they are responsible for leading exemplary lives worthy of emulation by the new ones. Besides, nurses are more careful due to various PSIs in the hospital environment.

They measured the working condition with the following indicators, job autonomy, and demand. The SEM test showed that working conditions directly and significantly positively affect safety-related awareness. It also showed that self-efficacy awareness increases with increasing job autonomy. Meanwhile, safety knowledge increased with decreasing workload. Nurses with high workloads found it challenging to receive training on patient safety and needed to pay more attention to PSMA, resulting in insufficient safety knowledge and control. Reducing workload and increasing work autonomy were essential for providing safe nursing care.

In totality, working conditions did not show a significant effect on PSMA. It is consistent with research by Hyeon-Hee1 and Soukyoung; their study reported that lower and higher job demands and autonomy did not affect PSMA. In the initial research plan, it is expected that the working condition has a significant influence either directly or indirectly on PSMA. It was because several researchers, including Kim & Jeong and Richard & Pascale, reported that working conditions directly or indirectly affect PSMA. Therefore, another research that focuses on categorizing the division of nurses concerning the same working conditions needs to be carried out in the future.

They measured the working environment with the following indicators, facilities based on the workplace design. The SEM test result showed that the working environment factor has a significant and positive effect directly on the safety culture. It is in line with Kirsten et al., whose research reported that a good physical work environment is a form of hospital support in promoting patient safety. Therefore, an effective work environment improves the safety culture. This factor also has a significant and positive effect both directly and indirectly on PSMA. In their research, Katarzyna et al. and Kirsten et al. reported that adequate facilities and a practical hospital layout increase productivity and patient safety.

They measured the management factor with the following indicators staffing and working procedures. The SEM test showed that the management factor does not indirectly offer a significant and positive effect on safety-related awareness. However, it showed a
significant and positive impact directly on the safety culture. It also had a total effect indicating that management significantly and positively affects safety culture. The result of Hyeon-Heel and Soukyoung in their report is that processes, work implementation designs, organizational work practices, and human resources policies do not increase each nurse’s safety awareness. It increased the culture that determines the management and organizational safety.

The management factor indirectly had a significant positive effect on PSMA realized through safety culture. It was because management attitudes and workforce allocation do not directly affect PSMA. The management should have clearly and appropriately documented policies and standards, safety education, and adequate safety-related resources. Considering an acceptable strategy regarding the number of patients per nurse is essential.

The safety-related awareness factor was measured by the following indicators, self-efficacy, safety control, and knowledge. The SEM test results showed that safety-related awareness has a direct and significant positive effect on the safety culture. It simply meant that the more enhanced the patient safety culture, the better the self-efficacy, safety control, and knowledge. Regarding its direct effect on PSMA, safety-related awareness had an insignificant impact. Furthermore, the safety-related awareness factor significantly and positively affected PSMA indirectly through safety culture. It increased safety culture through safety-related awareness.

The following indicators are teamwork measure safety culture, supervisor’s expectations and actions promoting patient safety, organizational learning, management support, feedback and communication about errors, openness, nonpunitive response to mistakes, and frequency of reported events. The SEM test result showed that the safety culture factor has a significant and positive effect directly on PSMA. Hyeon-Heel and Soukyoung, in their research, reported that hospitals with a good safety culture have better health services. It increases productivity and efficiency, improves workers’ morale, reduces absenteeism, and increases profits. Safety culture is not automatically formed; therefore, the direct supervisor and managers in the patient care environment need to exhibit a positive attitude by adopting standardized handover forms, various standard procedures to improve patient safety quality, nurses’ involvement in decision-making, and offer support. In addition, good safety culture is the first step to reducing workplace accidents.

This model validates the GoF and evaluates the direct or indirect influences of the factors above. A causal relationship and the impact of factors that affect nurse PSMA are identified. The two factors that mainly influence PSMA are safety culture and the working environment.

Could improve some limitations in this research. First, the participating responses of this study have not purposely selected based on specific criteria. It is interesting because, based on the result, different individual characteristics may lead to other parameters’ relationships. Deeper exploration is required to study the relationships, using the data set collected in the first month of data collection to study the characteristics of the questionnaire. Second, self-reported questionnaires with online responses can be biased toward the results. However, the survey was conducted during the COVID-19 pandemic with limited data collection and interaction time, so an online survey is the most appropriate method.

Third, this study adopts the percentage of positive responses as an assessment strategy. However, there are other scoring strategies for recapitulating the collected data, such as averaging individual averages and averaging some individuals, which can result in accurate dimensional scores. Fourth, this study used a cross-sectional design and could not access impact assessment over time. Future research can be explored using all these strategies and choosing the one that best fits the context and research objectives. Finally, the results of this study were only 2 type C private hospitals observed in Surakarta City and cannot be generalized to other hospitals in other cities in Indonesia.

Despite these limitations and due to the lack of research in Indonesia, this study provides essential information. It highlights some issues of patient safety culture in type C private hospitals in Indonesia. Therefore, expanding the survey scale related to type C private hospitals to include more healthcare providers and practitioners is necessary for future research. In addition, research on group dynamics and individual attitudes toward patient safety culture in measuring patient safety culture must also consider the interaction between organizational and personal factors.

CONCLUSION

This present research is aimed to build and test a model that identifies the main factors influencing nurses’ PSMA. SEIPS plays a relevant role in initiating problem-solving and determining factors influencing PSMA. Based on all these results, the most significant elements of PSMA are safety culture and the working environment. Both have a direct and significant positive effect on PSMA. Meanwhile, the other three factors, namely individual conditions, management, and safety-related awareness, have a significant and positive influence on PSMA, indirectly realized through the safety culture factor first. Two other factors, working conditions and safety-related awareness do not directly affect PSMA. There is a need to adopt the following steps to improve PSMA with the involvement of all parties who play an active role in each healthcare system. Increasing safety culture by reducing nurse turnover rates and providing adequate allocation of staffing, education, and policies improves PSMA.

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No potential conflict of interest relevant to this article was reported.

AUTHOR CONTRIBUTION

All authors equally contribute thoughts starting from the concept of investigation, information gathering, information investigation, factual investigation, changing, and correcting papers to detail
the considerations that arise through publication.

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