Organizational Learning—Continuous Improvement for Patients' Safety Climate: A PLS-SEM Analysis

Pembelajaran Organisasi—Peningkatan Berkelanjutan Bagi Iklim Keselamatan Pasien: Analisis Menggunakan PLS-SEM

Suryo Wibowo[(1)], **Michael Christian**[(2)], **Sunarno Sunarno**[(3)], **Rima Melati**[(4)], **Susanty Dewi Winata**[(5)]

[(1)]Department of Biomedical and Bioengineering, Indonesia International Institute for Life Sciences, Jakarta, Indonesia
[(2)]Department of Management, Universitas Bunda Mulia, Jakarta, Indonesia
[(3)]Department of Psychological Science Doctoral Program, Universitas Persada Indonesia YAI, Jakarta,Indonesia
[(4)]Faculty of Medicine, President University, West Java, Indonesia
[(5)]Faculty of Medicine and Health Science, Universitas Kristen Krida Wacana, Jakarta, Indonesia

Correspondence author: Michael Christian, Management, Universitas Bunda Mulia, Jakarta
Email: michaelchristianid@gmail.com

ABSTRAK

Kesadaran dan persepsi yang sama pada *health professional* di rumah sakit mengenai *safety climate* yang berorientasi pada keselamatan pasien sangat mungkin ditemukan tidak seragam. Padahal, hal ini akan dapat mempengaruhi *organizational learning—continuous improvement* yang juga dikaitkan dengan dukungan manajemen. Penelitian ini bertujuan untuk menganlisis determinan *organizational learning—continuous improvement* dengan menggunakan kedua aspek tersebut. Penelitian ini merupakan penelitian kuantitatif dengan menggunakan survey yang secara acak melibatkan 48 *health professional* yang bekerja di rumah sakit di Indonesia. Pengumpulan data menggunakan kuesioner sebagai instrument penelitian. *Structural Equation Modeling- Partial Least Square* dengan SMART PLS digunakan untuk alat analisis penelitian ini. Kondisi pandemi menjadi tantangan utama dalam mendapatkan umpan balik dari para partisipan. Hasil penelitian ini menjelaskan bahwa *safety climate* secara signifikan berpengaruh terhadap *organizational learning—continuous improvement* (p = 0,007). Hasil berikutnya penelitian ini menjelaskan bahwa *management support* secara signifikan berpengaruh terhadap *organizational learning—continuous improvement* (p = 0,003). Dukungan manajemen pada penelitian ini tidak berperan sebagai efek pemoderasi (p = 0,127). Secara keseluruhan, penelitian ini menjelaskan bahwa penggunaan *safety climate* dan management support dalam mengukur *organizational learning—continuous improvement* sebesar 70,4%.

Kata Kunci: Iklim keselamatan, Dukungan Manajemen, Keselamatan Pasien, Pembelajaran Organisasi, Tenaga Profesional Kesehatan

ABSTRACT
The same awareness and perception of health professionals in hospitals regarding a patient-centered safety climate is very likely to be found to be non-uniform. Indeed, this will have an impact on organizational learning—continuous improvement, which is also linked to management support. Using these two aspects, this study intends to investigate the determinants of organizational learning—continuous improvement. This is a quantitative study that used a randomized survey of 48 health professionals working in hospitals throughout Indonesia. Data was collected using a questionnaire as a research instrument, and the analysis tool in this study was structural equation modeling—partial least squares with SmartPLS. The findings of this study support that safety climate has a significant impact on organizational learning—continuous improvement (p = 0.007). This study's next finding explains that management support has a significant effect on organizational learning—continuous improvement (p = 0.003). In this study, management support had no moderating effect (p = 0.127). According to this study, 70.4 percent of organizations use safety climate and management support to measure organizational learning and continuous improvement.

Keywords: Safety Climate, Safety Management, Patient Safety, Organizational Learning, Health Professionals

INTRODUCTION

Patient safety incidents continue to be a problem in the delivery of health care and are one of the leading causes of morbidity and mortality (Jha *et al*., 2013). According to World Health Organization (WHO) data, 134 side effects occur in hospitals in low- and middle-income countries each year (Fleming & Wentzell, 2008). According to the Directorate General of Health Services, the number of reported patient safety incidents in Indonesia in 2019 reached 10,570 (Adriansyah *et al.*, 2022).

Management support and the implementation of a patient safety culture are expected to go hand in hand in practice. However, it is not uncommon for these two elements to coexist without even supporting one another. Several studies have been conducted to explain the phenomenon of "safe climate." Nonetheless, the findings remain focused on the culture of patient safety as it relates to clinical outcomes (DiCuccio, 2015). Indeed, more comprehensive, and diverse studies are required to assist organizations such as hospitals in carrying out learning and improving organizational quality. In fact, worker awareness and perception of the safety climate are still likely to be non-uniform. Patient safety, as is well known, has been identified as a critical component of healthcare organizations (Kong *et al.*, 2019), beginning with company management, policymakers, and educators (El-Jardali *et al*., 2014).

Patient safety is described in various scientific publications as having several functions or purposes. Patient safety, as in China, aims to prevent medical errors *(Zhou et al.*, 2018). According to Wagner *et al*., (2013) in terms of management support for patient safety and organizational learning—continuous improvement, health care professionals in the United States are more positive about hospital safety cultures than health care professionals in other Dutch and Taiwanese countries. However, this will be heavily influenced by a country's hospital policies, particularly applicable regulations, and policies.

As a creator, the safety climate is an important aspect in terms of increasing sustainable organizational learning (He *et al*., 2022; J.Nielsen, 2014; McFadden *et al*., 2014). Furthermore, Wagner *et al*. (2013) and Elsous *et al.*, (2017) research added aspects of management support in supporting the improvement of continuous organizational

learning. Based on these explanations, this study examines these two factors to determine how well sustainable organizational learning is improving.

The study's formulation of the problem is whether the safety climate and management support for patient safety affect organizational learning—continuous improvement. Furthermore, this study highlights management support as a moderating variable in the relationship between organizational learning—continuous improvement and safety climate. This is due to the phenomenon's urgency, both scientifically and practically, which explains why management support can moderate the relationship between safety climate and organizational learning—continuous improvement. It is hoped that this will be part of the ongoing renewal of research on organizational learning—constant improvement.

Based on the explanations provided above, the following hypotheses are proposed: safety climate has a significant effect on organizational learning—continuous improvement (Hypothesis 1); management support has a significant effect on organizational learning—continuous improvement (Hypothesis 2); and management support moderates the effect of safety climate on organizational learning—continuous improvement (Hypothesis 3). (Hypothesis 3). Thus, the purpose of this study is to investigate the factors that influence organizational learning—continuous improvement for health professionals in hospitals—by utilizing aspects of safety climate and management support. Furthermore, management support was measured as a moderating variable in this study.

SUBJECT AND METHODS

This is a cross-sectional study that employs the probability sampling technique. Surveys are used to collect data for this quantitative study. The survey instrument was an online questionnaire that was distributed at random in March-April 2021. Indonesia was experiencing the COVID-19 pandemic at the time, which had a significant impact on the number of questionnaires returned. The population in this study are health professionals who work in hospitals, so professionals who work outside of hospitals are not included as criteria. Because the population size for the criteria in this study is unknown with certainty,

a sample size of 30 is considered adequate using the central limit theorem approach (Kwak & Kim, 2017). Following the screening process, 48 (90.57%) of the 53 participants who completed the questionnaire met the criteria for participation in this study and deserved further analysis. This study adheres to research ethics guidelines. All participants were asked if they would provide informed consent. Participants who agreed could continue to fill out the questionnaire. Furthermore, participants were told that they could stop filling out the questionnaire if any part of it made them uncomfortable. This questionnaire does not request personal information such as address, phone number, or medical history. As shown in Table 1, this questionnaire was created using three variables, each of which included 13 items on a Likert scale ranging from 1 to 5, with 1 indicating strongly disagree and 5 indicating strongly agree.

Table 1. Operational Variable

Variable	Definition	Adaptation		Source
		No	Item	
Safety climate (SFCL)	The state of an organization's occupational health and safety climate as part of its work safety culture.	1	This workplace's culture makes it simple to learn from (if any) the mistakes of others.	Channing et al., (2017); Sexton et al., (2006)
		2	Medical errors are handled properly in this facility.	
		3	If you want to inquire about patient safety, it is simple to know where to go.	
		4	It is encouraged to report any patient safety concerns to hospital management (related parties).	
		5	Receive appropriate feedback on the quality of your work.	
		6	It provides a sense of security when you are treated as a patient here.	
		7	It is difficult to discuss work errors that occur.	
Management support for patient safety (MGSU)	Organizational action through a series of efforts to create a work environment that promotes patient safety.	1	This workplace fosters an environment that prioritizes patient safety.	Alqattan et al., (2018); Wagner et al., (2013)
		2	Patient safety is a top priority for hospital administration.	
		3	If action is deemed necessary, hospital management will take it immediately.	
Organizational learning—continuous improvement (OLCI)	The organization strives for continuous and continuous improvement to foster a culture of patient safety.	1	Workers take proactive steps to improve patient safety.	Alqattan et al., (2018); Wagner et al., (2013)
		2	Workers believe that mistakes at work shape learning to improve in a more positive direction.	
		3	Workers assess the effectiveness of the improvements that have been implemented.	

This study employs SmartPLS 3.0 for partial structural modeling analysis. This analytical tool enables the analysis of the influence of variables with a small sample size. As illustrated in Figure 1, this study follows a structural path that includes two direct effect paths and one moderating effect path, with management support serving as the moderating variable. As a result, three hypotheses are examined in this study. If a dataset has the reliability and validity of a dataset, it can be properly analyzed. As a result, the data's reliability and validity were tested in this study. In this study, the reliability test looked at Cronbach's alpha (CA) and composite reliability (CR). To determine the data's reliability, the CA and CR results must be greater than 0.7. Furthermore, the validity test in this study examined the outer loading (OL) and average variance extracted results (AVE). To determine the validity of a data set, the OL results must be greater than 0.7 and the AVE greater than 0.5 (Barati et al., 2019). In this study, the fit model considers Standardized Root Mean Square (SRMR) results where SRMR 0.1 and $Chi^2 > 0.05$ (Hu & Bentler, 1999; Hussain et al., 2018). Based on the R^2 results, this study will also explain the coefficient of determination. R^2 values greater than 0.75 indicate that the exogenous variables used to measure endogenous variables are strong, values 0.5 to 0.75 are moderate, and values 0.5 are weak. This study examines the p-value results where $p < 0.05$ to explain the hypothesis results (Han et al., 2020; Jiang et al., 2019; Sturm et al., 2019).
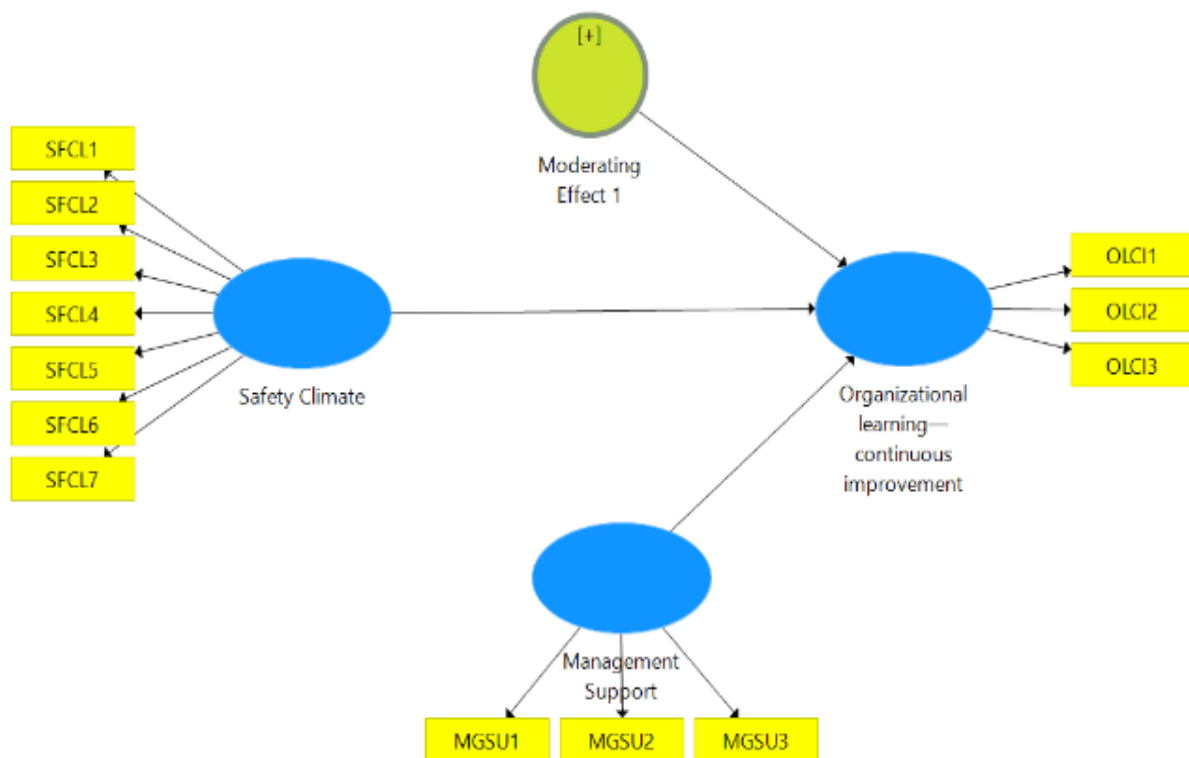
Figure 1. Research Framework

RESULTS AND DISCUSSION
Profile Distribution of Participants

The profiles of the participants in this study (Table 2) were almost evenly distributed between male and female participants. The participants in this study were dominated by adults aged 41-50 years old, with more than 40%, followed by participants aged 31-40 years old, with nearly 30%. Meanwhile, in terms of work/profession, more than 40% of the participants in this study were doctors. Participants working in health management in lower middle management and top management account for more than 20% and 13%, respectively. Pharmacy, occupational health advisor, sanitarian, inspection prevention and control, and occupational health and safety installations account for nearly 15% of the research participants' occupations. The proportion of nurses in this study was nearly 9%. Overall, these participants worked in hospitals, with class B hospitals accounting for more than 40% of the total. Furthermore, nearly 34% of participants worked in class A hospitals, while 21% worked in class C hospitals. In the meantime, only about 3% of participants work in class D hospitals. According to the type of hospital where the participants worked, nearly 60% worked in public hospitals and nearly 40% in private hospitals.

Table 2. Profile Distribution of Participants

Description	N	%	Description	N	%
Gender			**Hospital Area**		
Female	27	56.25%	DKI Jakarta	14	29.17%
Male	21	43.75%	West Java	21	43.75%
			East Java	7	14.58%
			Riau Islands	1	2.08%
			Lampung	1	2.08%
			West Kalimantan	1	2.08%
			South Sulawesi	1	2.08%
			South Sumatera	1	2.08%
			Banten	1	2.08%
Age (years old)			**Experience working in a hospital**		
21-30	8	16.67%	<1 year	3	6.25%
31-40	14	29.10%	1 year	5	10.42%
41-50	21	43.75%	2-3 years	13	27.08%
>50	5	10.42%	4-5 years	6	12.50%
			6-7 years	7	14.58%
			8-9 years	1	2.08%
			≥10 years	13	27.08%
Job/profession			**Should the work done have direct contact with the patient?**		
Doctor	21	43.75%			
Nurse	4	8.33%	Yes	17	35.42%
Management/administrative	10	20.83%	Sometimes	14	29.17%
Managerial in top management	6	12.50%	No	17	35.42%
Others	7	14.58%			
Hospital classification			**Have you ever gone through patient safety training?**		
General hospital class A	16	33.33%			
General hospital class B	21	43.75%	Yes	44	91.67%
General hospital class C	10	20.83%	No	4	8.33%
General hospital class D	1	2.08%			
Type hospital					
State-owned hospital	19	39.58%			
Public hospital	29	60.42%			

Most hospital locations for participants in this study were in West Java, accounting for more than 43 percent, with hospitals in DKI Jakarta accounting for nearly 30 percent. Participants who work in hospitals in East Java account for nearly 15% of the total. The remaining 2% of this study's participants worked in hospitals in the Riau Islands, Lampung, West Kalimantan, South Sulawesi, South Sumatra, and Banten. In this study, 27 percent of participants had 10 years or less of work experience. Participants with 6-7 years of work experience made up 14% of the total, while those with 4-5 years of work experience made up 12%.

Furthermore, those who had direct contact with patients at work had the same number as those who had direct contact with those who did not have direct contact, namely 35%, followed by those who had direct contact with patients at work occasionally by nearly 30%. On the other hand, more than 90% of participants in this study had prior experience with patient safety training.

PLS-Algorithm

This study employs Cronbach's Alpha (CA) and Composite Reliability (CR) results in the reliability test, where both CA and CR must be greater than 0.7. Meanwhile, for the validity test, this study employs the results of Average Variance Extracted (AVE) and Discriminant Validity, where AVE must be greater than 0.5 and Discriminant Validity must have a construct correlation value greater than the correlation value with other constructs. One item (SFCL7) on the safety climate and one item on management support (MGSU3) in the data processing do not meet the OL requirements and must be eliminated and reprocessed. Based on the reliability and construct validity results in Table 3, it is possible to conclude that all constructs in this study are reliable and valid.

Table 3. Construct Reliability and Validity

Variable	Item	OL	CA	CR	AVE	Discriminant Validity		
						SFCL	MGSU	OLCI
Safety Climate	SFCL1	0.847	0.886	0.913	0.638	0.799	-	-
	SFCL2	0.787						
	SFCL3	0.829						
	SFCL4	0.858						
	SFCL5	0.703						
	SFCL6	0.758						
Management Support	MGSU1	0.974	0.944	0.973	0.947	-	0.973	-
	MGSU2	0.972						
Organizational learning—continuous improvement	OLCI1	0.931	0.846	0.907	0.767	-	-	0.876
	OLCI2	0.748						
	OLCI3	0.934						

*OL=Outer Loading (>0.7); CA=Cronbach's Alpha (>0.7); CR=Composite Reliability (>0.7); AVE=Average Variance Extracted (>0.5)

**SFCL= Safety Climate; MGSU= Management Support; OLCI= Organizational learning—continuous improvement

The fit model in this study is shown in Table 4, where the results on the Standardized Root Mean Square (SRMR) <0.1 and Chi^2>0.05 indicate that the model in this study is said to be fit. R^2=0704 for the coefficient of determination in Organizational learning—continuous improvement. According to these findings, 70.4 percent of organizations use Safety Climate and Management Support to measure organizational learning and continuous improvement.

Table 4. Model Fit and Coefficient of Determination

Description	Saturated Model	Estimated Model	R^2
SRMR	0.076	0.081	-
Chi^2	98.533	107.268	-
OLCI	-	-	0.704

SRMR<0.1; Chi^2>0.05; OLCI= Organizational learning—continuous improvement

Bootstrapping

The effects of each item are depicted in Figure 2. The availability of information or procedures that are easy to know where to go if you want to ask about patient safety (SFCL3) is the most dominant item that makes up the safety climate, followed by if there are patient safety problems, you are encouraged to convey this to management (participants) (SFCL4) in the hospital. Furthermore, the workplace forming a work climate that prioritizes patient safety (MGSU1) is the more dominant item forming the management support variable, followed by the item MGSU2 (Hospital management prioritizes patient safety). The dominant forming item on the variable organizational learning—continuous improvement is OLCI1, in which workers actively take the necessary steps to improve patient safety. The workers' measuring the effectiveness of the improvements made is the next forming item (OLCI3).
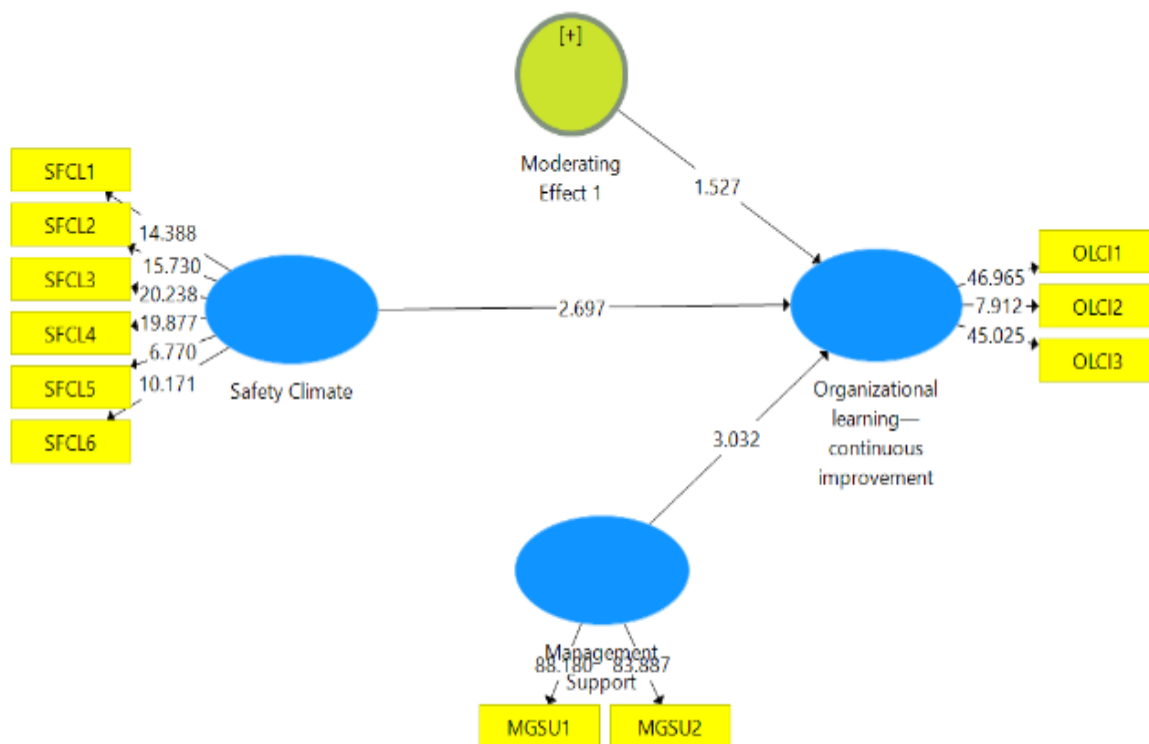
Figure 2. Bootstrapping

Testing hypotheses

The results of hypothesis testing (Table 5) in this study show that Safety Climate → Organizational learning—continuous improvement has a P Value of 0.007, which is less than 0.05, indicating that Safety Climate has a significant effect on Organizational learning—continuous improvement, or in other words, Hypothesis 1 is accepted in this study. Furthermore, this study shows a P Value of 0.003 or less than 0.05 on the path of Management Support → Organizational Learning—Continuous Improvement, indicating that Management Support has a significant effect on Organizational Learning—Continuous Improvement (H2 is accepted). The P value for this study in the moderating effect is 0.127. Because this result is greater than 0.05, it can be explained that Management Support has no effect on the relationship between Safety Climate and Organizational Learning—constant improvement. As a result, these findings explain why Hypothesis 3 is rejected.

Table 5. Testing hypotheses

Path	Standard Deviation	T-Statistic	P Values	Remark
Safety Climate → Organizational learning—continuous improvement	0.165	2.697	0.007	H1 accepted
Management Support → Organizational learning—continuous improvement	0.175	3.032	0.003	H2 accepted
Moderating Effect 1 (Management Support) → Organizational learning—continuous improvement	0.100	1.527	0.127	H3 rejected

According to this study, the safety climate has a significant impact on organizational learning—continuous improvement. The hospital, as an organization, places a high value on patient safety. Implementing a safe environment in hospitals is a critical factor that must be considered by management. The availability of informative procedures for workers, particularly those related to patient safety concerns, emerged as the most influential factor in shaping the safety climate in this study. Furthermore, hospital administration believes that it must be directly and actively involved in patient safety issues. Continuity of cooperation between workers and hospital management can shape excellent hospital service performance. The findings of this study back up the findings of J.Nielsen's (2014) research, which explains how a health and safety organization (HSO) that focuses on safety interactions can improve safety culture. Other studies, such as McFadden *et al*. (2014) explain that in order to achieve continuous quality improvement, an effective patient safety climate must be implemented. In this case, top management's leadership style is critical, particularly in achieving continuous quality improvement in hospitals. Furthermore, this study emphasizes that if continuous quality improvement and a safe environment can coexist, the combined benefits for the hospital and the patient can be greater. In this way, the manner in which the management team collaborates to foster a culture of patient safety can contribute to job satisfaction *(*Wibowo *et al*., 2022). Similarly to research He *et al*., (2022), the safety climate develops as a reflection of the effectiveness of the organization's safety management efforts. This study also emphasizes how an open and non-judgmental culture, as well as the practice of sharing mistakes, can help to improve the safety climate over time.

This study also explains how management support has a significant impact on organizational learning—continuous improvement. In terms of management support for patient safety, this study emphasizes the hospital's ongoing efforts to create a work environment that prioritizes patient safety, one of which is implemented by making patient safety a top priority. This finding is consistent with research Wagner *et al*. (2013), which shows that management support for patient safety can shape the creation of organizational

learning—optimal continuous improvement. Comparing safety cultures with the goal of identifying improvement opportunities for hospital administration can be a good step that has the potential to provide the benefits of excellent service oriented to a patient safety culture. Efforts to maintain a good safety culture can be made by assessing the culture itself on a regular basis, one of which is through the attitude of healthcare providers (Elsous *et al*., 2017).

Other research (Alqattan *et al.*, 2018) emphasizes the importance of open communication between health professional workers in hospitals in shaping a patient safety culture. Teamwork within the unit, as well as organizational learning and continuous improvement, can be powerful motivators in shaping hospital service improvement and management. The widely known concept of "safety culture" is a critical factor in achieving excellent quality in the provision of health services. In this regard, Kong *et al.* (2019) explain that establishing a good patient safety culture will result in increased safety. The same and uniform view on patient safety for all health professionals in the hospital must be maintained and improved to form awareness and achieve a culture of safety climate that is oriented toward patient safety.

Even though no one can predict COVID-19, management support is critical for patient safety. Patient safety incidents can be reduced through hospital preparedness and patient safety measures. This can be accomplished, for example, by avoiding treatment delays and administrative mistakes (Dhamanti *et al.*, 2022). Organizational learning and continuous improvement are critical in the early stages of the pandemic, when there is still a scarcity of data about the virus, to respond quickly to changing events and ensure the safety of patients with and without COVID-19 (Staines *et al*., 2021). Patient safety becomes even more important during the peak of the pandemic, when hospitals serving COVID patients are overcrowded. Furthermore, the number of COVID-19 cases in hospitals may be affected by how well public accepts the vaccine. This is determined by how much information the general public has about COVID-19 *(Girsang et al., 2022)*, and the younger generation is no exception (Christian *et al*., 2022). Similarly, patient safety is critical in hospitals that do not serve COVID patients to keep non-COVID

patients from contracting COVID. Many health workers in Indonesia are affected by COVID-19 during peak times, necessitating a quarantine period. As a result, the workload for the remaining health workers increases. Patient safety issues are likely to be overlooked as workload increases.

This study has some limitations as well. The sample size used during the COVID-19 pandemic was relatively small, allowing it to be expanded in future studies. Other external aspects, such as the community's intention to conduct examinations in hospitals during a pandemic during worry or fear, can be suggested variables to be studied in future research, which is expected to enrich the results of research in explaining organizational learning—continuous improvement.

CONCLUSION

This study explains that management support for patient safety has a direct effect rather than a moderating effect in the context of organizational learning—continuous improvement. As a result, this study demonstrates that aspects of safety climate and management support can still be performed in accordance with their respective roles. The link between the two aspects will support organizational learning—constant improvement in hospital patient safety culture.

The availability of job feedback from management for workers can be more informatively conveyed when establishing a safety climate. As patient safety becomes a higher priority for hospitals, patient safety campaigns are being implemented to raise awareness among all hospital stakeholders. Management and employees must also be reminded on a regular basis that improvements resulting from deficiencies or errors are aimed at better shaping a patient safety culture. This is consistent with the application of the concept of organizational learning—constant improvement.

ACKNOWLEDGMENTS

REFERENCES

Adriansyah, A. A., Setianto, B., Lestari, I., Arindis, P. A. M., Kurniawana, W. E., & Sa'adah, N. (2022). Incident analysis of patient safety in hospital: Based on feedback and supervision concept. *Bali Medical Journal*, *11*(2), 665–670. https://doi.org/10.15562/bmj.v11i2.3137

Alqattan, H., Cleland, J., & Morrison, Z. (2018). An evaluation of patient safety culture in a secondary care setting in Kuwait. *Journal of Taibah University Medical Sciences*, *13*(3), 272–280. https://doi.org/10.1016/j.jtumed.2018.02.002

Barati, M., Taheri-Kharameh, Z., Farghadani, Z., & Rásky, É. (2019). Validity and Reliability Evaluation of the Persian Version of the Heart Failure-Specific Health Literacy Scale. *International Journal of Community Based Nursing and Midwifery*, *7*(3), 222–230. https://doi.org/10.30476/IJCBNM.2019.44997

Channing, S., Ryan, N., Barnes, S., Collins, K., Nelson, H. van der, Mears, J., & Siassakos, D. (2017). Could low Safety Attitudes Questionnaire scores be indicative of an environment where it may be difficult to get new training practices established? *BMJ Simulation & Technology Enhanced Learning*, *3*(2), 54–59. https://doi.org/10.1136/bmjstel-2016-000135

Christian, M., Indriyarti, E. R., Sunarno, S., & Wibowo, S. (2022). Determinants of Satisfaction Using Healthcare Application: A Study on Young Halodoc Users in Jakarta During the COVID-19 Pandemic. *Applied Quantitative Analysis*, *2*(1), 36–48. https://doi.org/10.31098/quant.947

Dhamanti, I., Indriani, D., Miftahussurur, M., Kurniawati, E., & Engineer, C. Y. (2022). Impact of hospital readiness on patient safety incidents during the COVID-19 pandemic in Indonesia: health worker perceptions. *BMJ Open*, *12:e061702*, 1–9. https://doi.org/10.1136/bmjopen-2022-061702

DiCuccio, M. H. (2015). The Relationship Between Patient Safety Culture and Patient Outcomes: A Systematic Review. *Journal of Patient Safety*, *11*(3), 135–142. https://doi.org/10.1097/PTS.0000000000

000058

El-Jardali, F., Sheikh, F., Garcia, N. A., Jamal, D., & Abdo, A. (2014). Patient safety culture in a large teaching hospital in Riyadh: baseline assessment, comparative analysis and opportunities for improvement. *BMC Health Services Research*, *14*(122), 1–15. https://doi.org/10.1186/1472-6963-14-122

Elsous, A., Sari, A. A., AlJeesh, Y., & Radwan, M. (2017). Nursing perceptions of patient safety climate in the Gaza Strip, Palestine. *International Nursing Review*, *64*(3), 446–454. https://doi.org/10.1111/inr.12351

Fleming, M., & Wentzell, N. (2008). Patient safety culture improvement tool: development and guidelines for use. *Healthcare Quarterly (Toronto, Ont.)*, *11(3 Spec*, 10–15. https://doi.org/10.12927/hcq.2013.19604

Girsang, L. R., Situmeang, I. V. O., & Christian, M. (2022). Influence of Information and Knowledge towards Attitude in Receiving Vaccines. *Jurnal ASPIKOM*, *7*(1), 112–127. https://doi.org/10.24329/aspikom.v7i1.946

Han, Y., Kim, J.-S., & Seo, Y. (2020). Cross-Sectional Study on Patient Safety Culture, Patient Safety Competency, and Adverse Events. *Western Journal of Nursing Research*, *42*(1), 32–40. https://doi.org/10.1177/0193945919838990

He, Y., Lee, J., Huang, Y., Yao, X., & Courtney, T. K. (2022). Error Disclosure Climate and Safety Climate Trajectories: the Mediating Role of Counterfactual Sharing. *Journal of Business and Psychology*. https://doi.org/10.1007/s10869-022-09830-2

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Hussain, S., Fangwei, Z., Siddiqi, A. F., Ali, Z., & Shabbir, M. S. (2018). Structural Equation Model for Evaluating Factors Affecting Quality of Social Infrastructure Projects. *Sustainability*, *10*(1415), 1–25. https://doi.org/10.3390/su10051415

J.Nielsen, K. (2014). Improving safety culture through the health and safety organization: A case study. *Journal of Safety Research*, *48*, 7–17. https://doi.org/10.1016/j.jsr.2013.10.003

Jha, A. K., Larizgoitia, I., Audera-Lopez, C., Prasopa-Plaizier, N., Waters, H., & Bates, D. W. (2013). The global burden of unsafe medical care: analytic modelling of observational studies. *BMJ Quality & Safety*, *22*(10), 809–815. https://doi.org/10.1136/bmjqs-2012-001748

Jiang, K., Tian, L., Yan, C., Li, Y., Fang, H., Peihang, S., Li, P., Jia, H., Wang, Y., Kang, Z., Cui, Y., Liu, H., Zhao, S., Anastasia, G., Jiao, M., Wu, Q., & Liu, M. (2019). A cross-sectional survey on patient safety culture in secondary hospitals of Northeast China. *PLOS ONE*, *14*(3), e0213055. https://doi.org/10.1371/journal.pone.0213055

Kong, L.-N., Zhu, W.-F., He, S., Chen, S.-Z., Yang, L., Qi, L., & Peng, X. (2019). Attitudes towards patient safety culture among postgraduate nursing students in China: A cross-sectional study. *Nurse Education in Practice*, *38*, 1–6. https://doi.org/10.1016/j.nepr.2019.05.014

Kwak, S. G., & Kim, J. H. (2017). Central limit theorem: the cornerstone of modern statistics. *Korean Journal of Anesthesiology*, *70*(2), 144–156. https://doi.org/10.4097/kjae.2017.70.2.144

McFadden, K. L., Stock, G. N., & Charles R. Gowen III. (2014). Leadership, safety climate, and continuousquality improvement: Impact on processquality and patient safety. *Health Care Management Review*, *40*(1), 1–11. https://doi.org/10.1097/HMR.0000000000000006

Sexton, J. B., Helmreich, R. L., Neilands, T. B., Rowan, K., Vella, K., Boyden, J., Roberts, P. R., & Thomas, E. J. (2006). The Safety Attitudes Questionnaire: psychometric properties, benchmarking data, and emerging research. *BMC Health Services Research*, *6*(44).

https://doi.org/10.1186/1472-6963-6-44

Staines, A., Amalberti, R., Berwick, D. M., Braithwaite, J., Lachman, P., & Vincent, C. A. (2021). COVID-19: patient safety and quality improvement skills to deploy during the surge. *International Journal for Quality in Health Care : Journal of the International Society for Quality in Health Care*, *33*(1), 1–9. https://doi.org/10.1093/intqhc/mzaa050

Sturm, H., Rieger, M. A., Martus, P., Ueding, E., Wagner, A., Holderried, M., Maschmann, J., & WorkSafeMed Consortium. (2019). Do perceived working conditions and patient safety culture correlate with objective workload and patient outcomes: A crosssectional explorative study from a German university hospital. *PloS One*, *14*(1), e020948. https://doi.org/10.1371/journal.pone.0209487

Wagner, C., M Smits, J. S., & Huang, C. C. (2013). Assessing patient safety culture in hospitals across countries. *International Society for Quality in Health Care*, *25*(3), 213–221. https://doi.org/10.1093/intqhc/mzt024

Wibowo, S., Christian, M., Sunarno, S., & Yuniarto, Y. (2022). Determinants of Stress Recognition and Job Satisfaction in Hospitals For Health Professionals in Indonesia. *Journal of Industrial Engineering and Management Systems*, *15*(1), 26–34. https://doi.org/10.30813/jiems.v15i1.3601

Zhou, P., Bai, F., Tang, H., Bai, J., Li, M., & Xue, D. (2018). Patient safety climate in general public hospitals in China: differences associated with department and job type based on a cross-sectional survey. *BMJ Open*, *8*(4), 1–11. https://doi.org/:10.1136/bmjopen-2016-015604