



Organizational Factors Affecting Adoption of Electronic Medical Record (EMR) with Moderation of Openness to Experience

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Abstract

Adopting electronic medical records (EMR) in type C hospitals is essential for improving patient quality and safety. However, resistance within the healthcare industry and reluctance to accept new technologies present significant barriers. This delay in EMR implementation affects the quality of patient care and public health. This research aims to analyze the organizational factors that influence the adoption of Electronic Medical Records (EMR). There are six independent variables related to the organization, namely Management Support, Adequate Training, Patient Safety Climate, Physician's Involvement, Physician's Autonomy, and Patient Relationship. These variables are related to two mediating variables from the Technological Acceptance Model (TAM) theory, Perceived Usefulness and Perceived Ease of Use, which directly influence EMR adoption, moderating by Openness to Experience. The method used in this research was a survey of medical health workers whose work was related to EMR. Cross-sectional data were taken from 205 respondents from two type C private hospitals in December 2023. The data analysis method used was Partial Least Squares-Structural Equation Modeling (PLS-SEM). The research findings show sufficient evidence to state that all independent variables have a significant and positive influence on Perceived Usefulness and Perceived Ease of Use (P-value <0.05, CI 95%). The strongest influence was found in Patient Relationship ($\beta=0.501$) and Patient Safety Climate ($\beta=0.404$). The results of this research can provide suggestions for improving patient conditions and illnesses, thereby enhancing the quality of care and benefiting the overall health of communities through the implementation of EMR.

Introduction

The adoption of EMRs is a critical factor in enhancing healthcare delivery and improving patient outcomes. As healthcare organisations increasingly transition from paper-based systems to digital solutions, understanding the organisational factors influencing this adoption process becomes imperative (Jawhari *et al.*, 2016). This paper delves into the various organizational factors that affect the implementation and utilization of EMRs, focusing on the moderation effect of individual characteristics, specifically Openness to Experience (Zhang *et al.*, 2020). The Indonesian government actively encourages

and requires the use of EMRs in health service facilities through the Indonesian Ministry of Health (Indonesian Ministry of Health, 2022). Studying the organisational factors affecting the adoption of EMRs in type C hospitals, with moderation of Openness to Experience, is crucial for several reasons. Type C hospitals often face unique challenges, such as limited financial and technical resources, which can hinder EMR adoption (Wurster *et al.*, 2023). These hospitals may face different institutional pressures compared to larger hospitals.

There is a gap in the literature regarding EMR adoption in type C hospitals (Shin *et al.*, 2021). In Indonesia, a Type C hospital must

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meet several key requirements to ensure the provision of adequate and quality healthcare services (Indonesian Ministry of Health, 2014). Firstly, these hospitals are required to offer general medical and emergency services. Additionally, they may offer other specialist services based on community needs. The infrastructure must include radiology, laboratory, pharmacy, and inpatient services, with basic medical equipment. The healthcare personnel must include general practitioners and specialists corresponding to the provided services, supported by nurses and other healthcare professionals like pharmacists, laboratory analysts, and radiographers. Meeting environmental health standards is mandatory; they need to offer a minimum of 100-200 beds. Therefore, effective management and administration systems are required, encompassing financial, human resources, and service management, along with hospital information systems that ideally include EMR (Indonesian Ministry of Health, 2014). This study can fill the gap, providing valuable data that can lead to improved strategies for EMR implementation, better healthcare outcomes, and a more comprehensive understanding of the factors influencing technology adoption in healthcare settings.

Further research is needed with data sources from medical personnel in hospitals. Therefore, a study was carried out by considering references related to the topic of EMR adoption. Several studies have been conducted on EMR adoption (Abdullah, 2023; Akwaowo *et al.*, 2022; Eden *et al.*, 2020), including research in Indonesia (Saragih *et al.*, 2020). However, only a few studies include organisational factors as independent variables. Previous research (Abdekhoda *et al.*, 2019) has highlighted the role of organization and work environment in the adoption of EMRs. These organizational factors consist of five independent variables, such as Management Support, Adequate Training, Physician's Involvement, Physician's Autonomy, and Patient Relationship. These factors are known to influence two components of TAM, namely Perceived Usefulness and Perceived Ease of Use, which have a direct impact on EMR adoption. However, this research model does not include Patient Safety, which is relevant and closely related to EMR. The study conducted by Deharja *et al.*, highlights that overall satisfaction with EMR systems is influenced significantly by user attitudes. Specifically, positive attitudes toward EMRs, such as finding the system enjoyable and useful for work, lead to higher overall satisfaction, which in turn enhances the

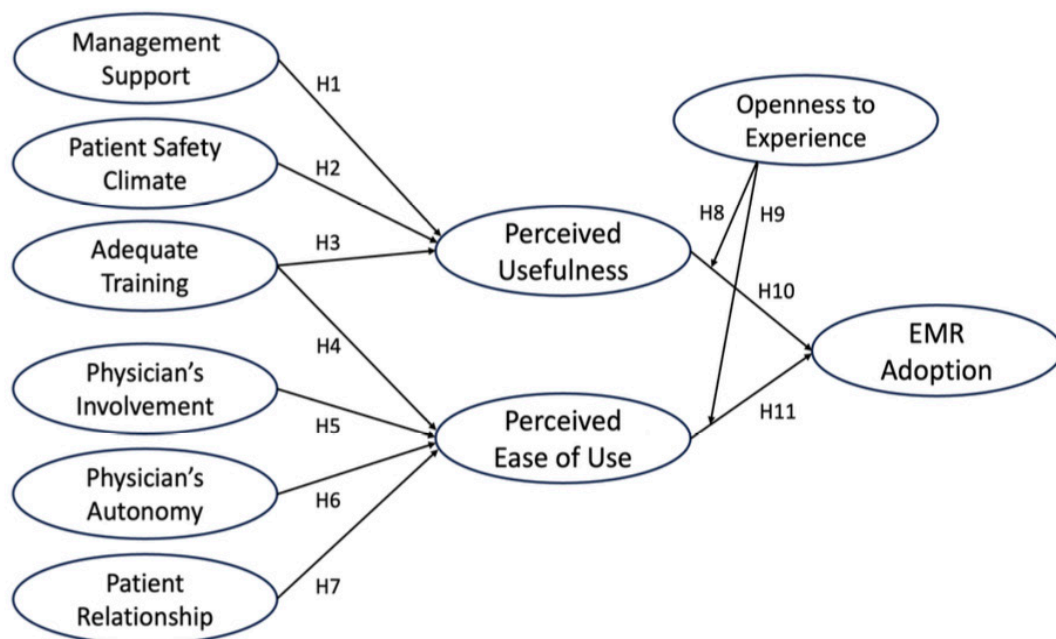


Figure 1. Conceptual Framework

perceived benefits of using the system (Deharja *et al.*, 2023). This concept aligns with the role of perceived usefulness and ease of use in EMR adoption, as positive perceptions about the ease and utility of EMRs can increase overall user satisfaction. In both studies, satisfaction acts as a crucial mediator between system usage and perceived benefits, suggesting that improving user attitudes and satisfaction should be central to strategies aimed at increasing EMR adoption in type C hospitals.

The position of this research is to propose a modified research model by adding Patient Safety Climate as an independent variable that can influence Perceived Usefulness. Thus, in this model, there are six variables related to the organization, namely Management Support, Adequate Training, Patient Safety Climate, Physician's Involvement, Physician's Autonomy, and Patient Relationship. Adequate Training ensures that healthcare professionals are well-equipped with the necessary skills and knowledge to efficiently utilize EMR, thereby reducing errors and increasing efficiency. Additionally, intrinsic factors from physicians, such as their commitment to patient care and professional growth, play a critical role in the successful adoption and utilization of the EMR system (Selna *et al.*, 2022). These factors will add a comprehensive understanding that can improve the delivery of patient quality of care. These six variables are related to two mediating variables derived from TAM theory, namely Perceived Usefulness and Perceived Ease of Use. These two variables have a direct influence on EMR adoption as well as mediating the influence of the independent variables. This relationship is mediated by Openness to Experience, which is one of the Five Big Personality Traits (Minbashian *et al.*, 2013). Where this variable has been proven to be a significant moderating variable (Fernández-Mesa *et al.*, 2020; Pagon *et al.*, 2011). This model will be tested on healthcare workers at two type C hospitals whose work is related to EMR using the PLS-SEM analysis method. If the EMR adoption process takes a long time, it can hamper clinical and administrative workflows, which can result in increased workload and decreased productivity, hence reducing the quality of care given to the patients (Lloyd *et*

al., 2023). Therefore, this research is important in the progress of EMR adoption in hospitals in Indonesia.

Method

This research is a quantitative cross-sectional adopts a previous research model (Donabedian, 1988) through a self-administered questionnaire distributed to healthcare workers from two type C private hospitals in Jakarta. These hospitals are owned by a group that has several hospitals in different locations and were chosen because it was recently implemented EMR in 2020. These hospitals also serve *Badan Penyelenggara Jaminan Sosial* (BPJS) and are accredited by national standards. The research population was all medical personnel who had worked for more than one year in type C private hospitals in Jakarta and whose work was related to EMR. This research used a non-probability sampling approach where individuals in the population do not have the same chance of being taken as research samples. Data were collected for 1 month in December 2023.

The survey started with an online questionnaire through Google Forms. Our study sample consisted of a total of 205 respondents who gave their informed consent and answered the questionnaire. The study received ethical approval from the Institutional Review Board of Pelita Harapan University Medical Research Council No. 026/M/EC-Nov/XI/2023. The Google Form consisted of 43 questions and was used to collect data; it was self-administered and used valid and reliable Likert-scale instruments. The survey used a questionnaire consisting of an introductory part and 2 main sections. The introductory part consisted of informed consent for this study, voluntarily, and anonymously, and will be used only for academic purposes. The first main section consisted of the respondent profile. The second main section consisted of 39 total questions with 4 questions on Adequate Training, 4 questions on EMR Adoption, 4 questions on Management Support, 3 questions on Openness to Experience, 4 questions on Patient Relationship, 4 questions on Patient Safety Climate, 4 questions on Perceived Ease of Use, 4 questions on Physician's Autonomy, 4 questions on Physician's Involvement, 4

questions on Perceived Usefulness.

EMR adoption in hospitals is based on Structure-Process-Outcome (SPO) as stated by Donabedian (Donabedian, 1988). According to the theory, hospital management can elevate organizational and environmental factors in EMR adoption to ensure high-quality patient care. Some studies stated the TAM theory of how individuals accept and use new technology or innovation (Alsyounf *et al.*, 2023; Holden & Karsh, 2010; Saragih *et al.*, 2020). There are 2 main key features, Perceived Usefulness and Perceived Ease of Use. Perceived Usefulness explains how individuals accept the technology if they believe that technology use will make their task easier. Perceived Ease of Use explains the user's beliefs about how easy or difficult it is to use the technology. The organizational structure and environmental factors consist of Management Support, Patient Safety Climate, Adequate Training, Physician's Involvement, Physician's Autonomy, and Patient Relationship.

This research model is a modification of previous research with 2 additions (Abdekhoda *et al.*, 2019). Firstly, the Patient Safety Climate variable is included as a marker of the implementation of patient safety culture in the hospital. This variable is expected to clarify the role of the organization, especially from aspects of organizational culture related to service quality. Secondly, by placing the moderating variable Openness to Experience in predicting EMR adoption. This variable shows individuals with personalities who tend to be open to getting or learning new things (Derecho *et al.*, 2024). It is hoped that the placement of this variable will help management better understand the personal background of medical personnel, which can support their performance. The data analysis method in this research was analyzed using dimensional analysis in PLS-SEM. The conceptual framework seen in Fig. 1 was regarded as a difficult research model. Therefore, the PLS-SEM approach was used since it could assess complex models in this research. When the emphasis of the investigation is on the model's explanatory and predictive qualities, PLS-SEM techniques are preferred (Hair *et al.*, 2020).

Result and Discussion

This research model was conducted on two type C private hospitals in Jakarta whose work is related to EMR. There were 205 respondents, and the demographic data are presented in Table 1. The biggest percentage of respondents were 26-35 years old, followed by people 36-45 years old, whilst the smallest percentage belonged to people over 45 years old. This age data can be related to the fact that the younger generation is more exposed to information and communication technology, or is referred to as the digital generation, who are accustomed to accepting new technology, for example, the use of smartphones (Lathiifah *et al.*, 2023). More than half of the respondents were Nurses, followed by General Practitioners (GP), Specialists, and Dentists. Almost half of the respondents work in the Inpatient department, while only 4 work in the Obstetric Ward. Most respondents (83%) had over three years of work experience, indicating familiarity with the hospital's organizational culture and environment. Therefore, the respondents are considered representative in providing information on organizational factors and EMR implementation in hospitals.

To assess the reliability indicator, outer loading was measured. From the results of PLS-SEM data processing, it was found that almost all outer loading values have passed the specified threshold of 0.708, except for 2 indicators. According to the guidelines for assessing outer loading results (Sarstedt, Hair, *et al.*, 2022), both values can still be maintained because they are above 0.4 and their presence does not interfere with the values of the Cronbach alpha and Average Variance Extracted (AVE) variables concerned. If the outer loading value of the reflective indicator was found to be above the limit of 0.708, then the indicator was declared reliable for measuring the construct. In other words, this indicator has shown its consistency as an indicator when used repeatedly (Hair *et al.*, 2020). From the internal consistency test, all constructs showed Cronbach's alpha of more than 0.7, and composite reliability is in the range of 0.7 and 0.95, indicating that the constructs' reliability in the respective models is reliable. AVE measurement determined the convergent validity. This validity check shows

Table 1. Respondent Profile

Description	Categories	Number of Respondents	Percentage (%)
Current Age	18-25 years old	40	20
	26-35 years old	78	38
	36-45 years old	52	25
	>45 years old	35	17
Total		205	100
Length of Work in the hospital	Less than 3 years	35	17
	3-5 years	55	27
	6-10 years	87	42
	More than 10 years	28	14
Total		205	100
Health Care Background	Nurse	131	64
	General Practitioner	35	17
	Dentist	7	4
	Specialist	17	8
	Other	15	7
Total		205	100
Work Unit	Inpatient	89	44
	Outpatient/ polyclinic	32	16
	Emergency Department	23	11
	Intensive Care Unit (ICU)	21	10
	Operating Theatre	17	8
	Obstetric Ward	9	4
	Other	14	7
Total		205	100

Source: Primary Data (2023)

that each construct has an AVE ≥ 0.50 , which indicates that all constructs can explain at least 50% of the item in the model, therefore establishing convergent validity (Hair *et al.*, 2020). The highest AVE value is 0.808, while the lowest is 0.595. The results of the reliability and validity tests can be seen in Table 2.

The discriminant validity testing process is carried out by looking at the value of the Heterotrait-Monotrait ratio (HTMT Ratio). The interpretation of the HTMT matrix is that if the ratio value obtained is less than 0.9, it is said that the construct does not have a discriminant problem and the results are satisfactory and therefore said to be valid (Sarstedt, Radomir, *et al.*, 2022). In the reporting flow of the inner model analysis results, recommendations from Hair *et al.* (2019) and Sarstedt *et al.* (2022) are

followed, where, before reporting the hypothesis results, it is necessary to first evaluate the quality of the proposed research model. This is important because the goodness of fit model approach is not used in PLS-SEM (Hair *et al.*, 2020). Parameters in the inner model consist of Variance Inflation Factor (VIF), R-squared (R^2), f-squared (f^2), and Q-squared predict (Q^2 predict) (Hair *et al.*, 2020; Sarstedt, Hair, *et al.*, 2022). Figure 2 shows the outcome of the inner model, which is the result of bootstrapping with percentile settings, a re-sample of 10.000, one-tailed, and $\alpha=0.05$

Previously, common method bias, which can result from errors or biases in the measurement approach, was assessed through the inner VIF tests to check for potential multicollinearity issues. The results indicated

Table 2. Reliability And Validity Analysis

Variable	Codes	Indicators	Outer loading
<i>Adequate Training</i>	ADTRA1	I received the training I needed to better understand the use of electronic medical records.	0,932
	ADTRA2	Training in the use of electronic medical records is useful for me to understand how to use them properly.	0,864
	ADTRA3	Training in the use of electronic medical records made me understand new technologies that can improve the quality of patient care.	0,880
	ADTRA4	Electronic medical record training at this hospital provides new knowledge that is useful for my profession.	0,763
CA=0.887; Rho_a=0.939; Rho_c=0.920; AVE=0.743			
<i>EMR Adoption</i>	EMADOP1	I will continue to routinely use electronic medical records in my daily duties at this hospital.	0,772
	EMADOP2	I am willing to leave the old way and switch to using electronic medical records in this hospital.	0,846
	EMADOP3	I would also recommend the use of electronic medical records for new medical personnel working at this hospital.	0,912
	EMADOP4	I will continue to push for the use of electronic medical records in this hospital even though there are still minor errors found in the system.	0,836
CA=0.863; Rho_a=0.874; Rho_c=0.907; AVE=0.710			
	MANSU1	Implementing electronic medical records is important and a priority for top management at this hospital.	0,871
	MANSU2	So far, the process of implementing electronic medical records has been communicated effectively by the top management of this hospital.	0,876
	MANSU3	The top management of this hospital showed good intentions to assist medical personnel during the process of implementing electronic medical records.	0,816
	MANSU4	The top management of this hospital expressed their hope that I would be able to use electronic medical records according to the proposed program.	0,794
CA=0.860; Rho_a=0.863; Rho_c=0.905; AVE=0.706			
<i>Openness to</i>	OPTEX1	I feel like someone who enjoys learning new things in my job.	0,954
	OPTEX2	I am curious if there is a new program launched by management	0,860
	OPTEX3	I often imagine how things could be done in a different way.	0,881
CA=0.881; Rho_a=0.898; Rho_c=0.927; AVE=0.808			
<i>Patient</i>	PATREL1	The use of electronic medical records will not affect the credibility of doctors in the eyes of patients.	0,786
	PATREL2	With the existence of electronic medical records, patients will have more confidence in the quality of health services they receive at this hospital.	0,856
	PATREL3	The implementation of electronic medical records will not reduce the quality of communication between patients and doctors and other medical personnel.	0,624
	PATREL4	Patients will have more confidence in their doctors if electronic medical records are implemented well in this hospital.	0,799

Variable	Codes	Indicators	Outer loading
CA=0.780; Rho_a=0.829; Rho_c=0.853; AVE=0.595			
<i>Patient Safety Climate</i>	PATSAF1	I believe that with the presence of electronic medical records in this hospital, the treatment process with a focus on patient safety will increase.	0,880
	PATSAF2	Medical errors that can harm patients can be avoided by implementing electronic medical records in this hospital.	0,911
	PATSAF3	Electronic medical records can be used to track medical errors that occur and encourage improvements in patient safety.	0,737
	PATSAF4	Management encourages the implementation of electronic medical records to reduce the risk of medical errors occurring at this hospital.	0,840
CA=0.865; Rho_a=0.886; Rho_c=0.908; AVE=0.714			
<i>Perceived Ease of Use</i>	PEOUS1	In general, I feel that the electronic medical records at this hospital are easy to access and use.	0,852
	PEOUS2	I found the navigation menus in the electronic medical record easy to use.	0,865
	PEOUS3	I find it easy to understand the various menus available on the electronic medical record.	0,788
	PEOUS4	I easily got used to how to use electronic medical records at this hospital.	0,794
CA=0.845; Rho_a=0.865; Rho_c=0.895; AVE=0.681			
<i>Physician's Autonomy</i>	PHAUT1	Using electronic medical records will help hospital management to monitor health care and therapy provided by doctors and nurses.	0,898
	PHAUT2	The implementation of electronic medical records in this hospital will not interfere with the autonomy of doctors in assessing and making therapeutic decisions for patients.	0,917
	PHAUT3	The implementation of medical records is not intended to dictate, but will protect medical personnel from the possibility of legal claims.	0,735
	PHAUT4	I do not feel that my privacy is being disturbed by the electronic medical records at this hospital.	0,811
CA=0.862; Rho_a=0.871; Rho_c=0.907; AVE=0.711			
<i>Physician's Involvement</i>	PHINV1	I feel it is important to be actively involved in the process of implementing electronic medical records at this hospital.	0,837
	PHINV2	My active participation in the electronic medical record implementation process will contribute to the success of this program.	0,904
	PHINV3	I feel passionate about implementing electronic medical records in my daily work.	0,866
	PHINV4	I feel that it is my duty to support the implementation of electronic medical records in this hospital.	0,712
CA=0.851; Rho_a=0.873; Rho_c=0.900; AVE=0.694			

CA, Cronbach's Alpha; AVE, Average Variance Extracted; ADTRA, Adequate Training; EMADOP, EMR Adoption; MANSU, Management Support; OPTEX, Openness to Experience; PATREL, Patient Relationship; PATSAF, Patient Safety Climate; PEOUS, Perceived Ease of Use; PHAUT, Physician's Autonomy; PHINV, Physician's Involvement; PUSEF, Perceived Usefulness.

Source: Primary Data (2023)

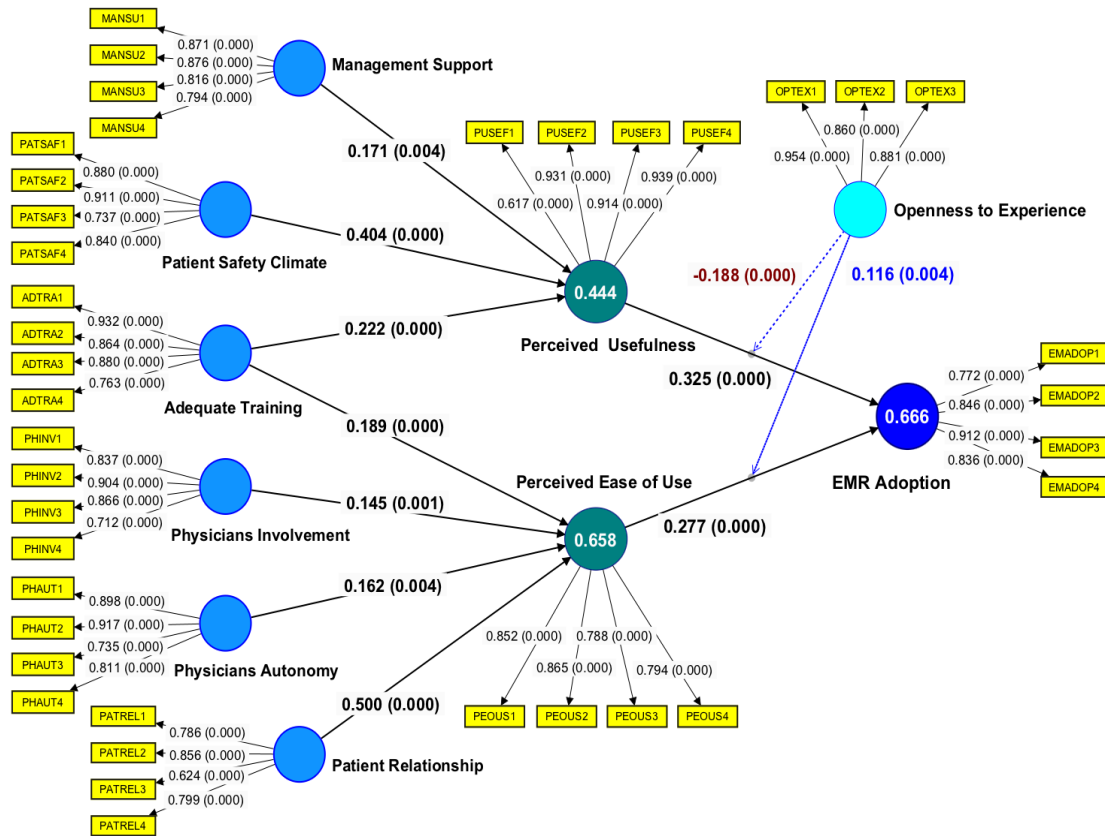


Figure 2. Inner Model

that all constructs had an inner VIF below 3, as recommended (Hair *et al.*, 2020; Sarstedt, Hair, *et al.*, 2022). Therefore, it can be concluded that there are no multicollinearity issues present in this model. The R^2 value for EMR adoption as a dependent variable is 0.666 and is therefore classified as having a moderate explanatory power category. The R^2 value for Perceived Usefulness and Perceived Ease of Use is 0.444 and 0.658, respectively. Therefore, they were classified as a moderate explanatory power category. Thus, it can be said that the respective model has a moderate explanatory capability to estimate the respective variable.

Patient Relationship has a large effect size on Perceived Ease of Use with an f^2 value of 0.398, while Patient Safety Climate shows a medium effect size, and other independent variables show a small effect size. Q^2 on EMR Adoption shows 0.611, Perceived Ease of Use shows $Q^2=0.637$, while Perceived Usefulness shows $Q^2=0.423$. Hence, EMR adoption and Perceived Ease of Use were categorized as a large predictive value (>0.5), while Perceived

Usefulness was categorized as medium predictive value. From this data, it can be said that the model can be considered to have adequate predictive ability to predict EMR adoption in hospitals. The results of the comparison showed that the Average loss difference has a negative value with a p-value of 0.000, so it can be said that this model has predictive capabilities. The results of the assessment using the CVPAT method, which has predictive value, confirm that this research model is adequate in predicting EMR adoption, which is the main concern of this study.

The results of hypothesis testing with the bootstrapping feature (Table 5) showed that all hypotheses were accepted ($p>0.05$, $CI\ 5\%$, and $CI\ 95\%$ following the direction of the hypothesis). This study shows that management support has a significant positive effect on Perceived Usefulness of EMR with a coefficient of 0.171 and a P-value of 0.004, indicating that the hypothesis results are supported. These results are in line with the research of Ebnehoseini *et al.*, which shows that management support is

Table 4. Cypat

Variabel	PLS-SEM vs. <i>Indicator average</i> (IA)		PLS-SEM vs. <i>Linear model</i> (LM)	
	<i>Average loss difference</i>	<i>p-value</i>	<i>Average loss difference</i>	<i>p-value</i>
EMR Adoption	-0,220	0,000	0,051	0,001
Perceived Ease of Use	-0,160	0,000	0,010	0,426
Perceived Usefulness	-0,170	0,000	0,086	0,001
Overall Model	-0,183	0,000	0,049	0,000

Source: Primary Data (2023)

very important in overcoming resistance and increasing the perception of the usefulness of EMR among healthcare staff (Ebnehoseini *et al.*, 2020). Strong management support facilitates the adoption of new technologies by providing the necessary resources and demonstrating the institution's commitment to EMR implementation. In addition, this study found that patient safety climate also has a significant positive effect on perceived usefulness with a coefficient of 0.404 and a P value of 0.000. This supports the findings of McAlearney *et al.*, who emphasised that a positive safety environment increases the perception of EMR utility by promoting a culture of safety and reliability in healthcare practices. Thus, creating a strong safety climate can encourage the acceptance and effective use of the EMR system in type C hospitals (McAlearney *et al.*, 2015).

The results of this study indicate that adequate training has a significant positive effect on Perceived Ease of Use with a coefficient of 0.189 and a P-value of 0.000. This indicates that proper training can improve nurses' ability to use EMR, which is consistent with the findings of Kipturgo *et al.*, who emphasized the importance of training in increasing technology adoption (Kipturgo *et al.*, 2014). In addition, physician involvement also has a positive effect on perceived ease of use with a coefficient of 0.145 and a p-value of 0.001. These results indicate that support and active involvement from physicians can help nurses feel more comfortable using EMR, supporting the research of Kalayou *et al.*, which states that physician involvement is a key factor in the successful implementation of health technology (Kalayou *et al.*, 2021).

Physicians' Autonomy and Patient Relationship also showed a positive effect on perceived ease of use, with coefficients of 0.162

and 0.500, respectively. These results indicate that physicians who have greater autonomy in decision-making and good relationships with patients can increase the ease of use of EMR by nurses. This finding is in line with the study by Jedwab *et al.*, which found that physician autonomy and positive interactions with patients contributed to the perception of ease of use of health technology (Jedwab *et al.*, 2021). The new contribution of this study, based on the Technology Acceptance Model (TAM) theory developed by Davis, is the emphasis on the importance of adequate training, physician involvement, physician autonomy, and patient relationships as critical factors in increasing the perception of ease of use of EMR. These findings broaden the understanding of the determinants influencing the adoption of health technology in private type C hospitals in Indonesia, which has previously been underexplored in this context (Schorr, 2023).

This study found that openness to experience moderates the relationship between perceived usefulness and EMR adoption with a coefficient of -0.188 (P value 0.000), indicating that openness to experience weakens this relationship. This indicates that individuals who are more open to new experiences may be more critical of the usefulness of EMR and need more reasons to adopt it. This study also found that openness to experience strengthens the relationship between perceived ease of use and EMR adoption with a coefficient of 0.116 (P value 0.004). This means that more open individuals tend to be more receptive to EMR if they feel the technology is easy to use. This finding is consistent with previous research by Svendsen *et al.*, which showed that individuals with high levels of openness tend to be more critical but also more adaptive to easy-to-use technology (Svendsen *et al.*, 2013). This study

extends the TAM theory by showing that personality characteristics such as openness to experience can influence technology adoption. This highlights the importance of considering personality factors in EMR implementation strategies to increase adoption rates and user satisfaction.

This study found that perceived usefulness has a significant positive effect on EMR adoption with a coefficient of 0.325 (P value 0.000), indicating that the perception of usefulness of EMR increases the adoption of this technology among nurses in type C hospitals. In addition, perceived ease of use is also proven to have a significant positive effect on EMR adoption with a coefficient of 0.277 (P value 0.000), which means that the ease of use of EMR also encourages its adoption.

This finding is consistent with Davis's TAM theory, which identifies perceived usefulness and perceived ease of use as the main factors influencing technology acceptance (Schorr, 2023). A study by Alaa and Ramayah showed similar results where perceived usefulness and perceived ease of use contributed significantly to the adoption of health information systems in various clinical settings (Alaa & Ramayah, 2023). The novel contribution of this study lies in the specific context of type C hospitals in Indonesia, strengthening the external validity of the TAM theory by confirming that these factors remain relevant in different settings and highlighting the importance of these two constructs in EMR implementation strategies to increase adoption rates in type C hospitals.

This study adds one variable, namely

Table 5. Hypothesis Test Results

Hypothesis		Standard -ized Coefficient	P- values	Confidence Interval (CI 95%)		f ²	Result
				Lower 5.0%	Upper 95.0%		
H1	Management Support -> Perceived Usefulness	0,171	0,004	0,068	0,281	0.035	Hypothesis Supported
H2	Patient Safety Climate -> Perceived Usefulness	0,404	0,000	0,299	0,505	0.188	Hypothesis Supported
H3	Adequate Training -> Perceived Usefulness	0,222	0,000	0,105	0,322	0.059	Hypothesis Supported
H4	Adequate Training -> Perceived Ease of Use	0,189	0,000	0,107	0,272	0.066	Hypothesis Supported
H5	Physicians' Involvement -> Perceived Ease of Use	0,145	0,001	0,066	0,228	0.043	Hypothesis Supported
H6	Physicians Autonomy -> Perceived Ease of Use	0,162	0,004	0,060	0,258	0.053	Hypothesis Supported
H7	Patient Relationship -> Perceived Ease of Use	0,500	0,000	0,383	0,619	0.398	Hypothesis Supported
H8	Openness to Experience x Perceived Usefulness -> EMR Adoption	-0,188	0,000	-0,262	-0,120	0.070	Hypothesis Supported
H9	Openness to Experience x Perceived Ease of Use -> EMR Adoption	0,116	0,004	0,043	0,186	0.026	Hypothesis Supported
H10	Perceived Usefulness -> EMR Adoption	0,325	0,000	0,240	0,409	0.198	Hypothesis Supported

Hypothesis		Standard -ized Coefficient	P- values	Confidence Interval (CI 95%)		f ²	Result
				Lower 5.0%	Upper 95.0%		
H11	Perceived Ease of Use -> EMR Adoption	0,277	0,000	0,185	0,369	0.124	Hypothesis Supported

Source: Primary Data (2023)

Openness to Experience, from the Big Five Personality Traits is argumentatively more relevant and important as a moderator of the relationship between TAM and EMR adoption than the other four personality traits because openness to experience is directly related to the tendency to accept and adapt to new technologies. Individuals with high levels of openness are more likely to explore, understand, and adopt new technologies, including EMR, compared to individuals with high levels of conscientiousness, extraversion, agreeableness, or neuroticism (Devaraj *et al.*, 2008). Psychological theory suggests that openness to experience fosters creativity and innovation, which are critical in responding to technological change. Research by Svendsen *et al.*, confirmed that openness to experience influences how individuals integrate new technologies into their work practices, strengthening the relationship between perceived ease of use and perceived usefulness with technology adoption (Svendsen *et al.*, 2013). Thus, openness to experience provides a more comprehensive framework for understanding the dynamics of EMR adoption through TAM.

From the analysis results, it is known that this research model has moderate explanatory power (R^2), but in segment analysis (PLS-POS), it can increase to strong explanatory power. Furthermore, this research model is known to have large predictive relevance (Q^2_{predict}) for the EMR adoption variable. The overall predictive ability of this model is confirmed by the results of the cross-validated prediction ability test (CVPAT). Thus, it can be concluded that the proposed research model is adequate to explain and predict EMR adoption in type C private hospitals. So this model can also be recommended for use in further research.

This study's novel contribution is to demonstrate a new independent variable on

Organizational factors, namely Patient Safety Climate, and a new moderation variable, namely Openness to Experience, between perceived usefulness and perceived ease of use to EMR adoption from one of the Big Five Personality Traits. This study reveals how individual characteristics that are open to new experiences can influence EMR adoption. These findings can be used by healthcare institutions to design training programs and more personalized approaches to implementing health technology, thereby increasing the acceptance and effective use of EMR. With better implementation of EMR, the quality of care and patient safety can be improved, and medical errors can be reduced. This finding also aligns with a study conducted by Fitriani *et al.*, that states that clinical governance, as measured by five dimensions and mediated by a patient safety culture, significantly impacts the quality of care (QOC) in hospitals. The study emphasizes that proactive risk management, integrated quality improvement, training and development, and a positive safety climate all contribute to improving QOC (Fitriani *et al.*, 2024). The adoption of EMR systems may also be improved by focusing on factors such as training and supportive management, which facilitate ease of use and perceived usefulness, similar to how patient safety culture mediates the impact of clinical governance on care quality. Both research pieces underscore the importance of a structured and supportive work environment to drive successful technology adoption and improve healthcare outcomes. A study conducted by Sutanto *et al.*, highlights the critical role of organizational culture and training in influencing healthcare outcomes. Factors like management support and adequate training are key in shaping perceived usefulness and ease of use, which can enhance EMR adoption. Similarly, fostering a safety culture

through empowerment can facilitate EMR adoption, as empowered healthcare personnel are more likely to embrace and effectively use digital health technologies (Sutanto *et al.*, 2024).

The previous study conducted by Dewi and Mahyuni showed that there is a genuine demand for digital healthcare services driven by both necessity and hedonic factors (Dewi & Mahyuni, 2024). The findings highlight the need for developers to enhance usability and create appealing interfaces to improve the acceptance of digital healthcare. Additionally, it suggests that addressing user feedback by improving ease of use and increasing advertising efforts will help in broader adoption. In this study, organizational factors such as adequate training and patient safety climate are crucial for fostering positive attitudes toward EMR, and usability and ease of use are key in enhancing the adoption of digital health solutions. Both of these research findings correlate the critical role of user satisfaction and positive experiences in ensuring the successful adoption of healthcare technologies. Furthermore, understanding the role of personality in technology adoption can help hospital policy makers in developing strategies that are more adaptive to the characteristics of healthcare workers, thereby accelerating digital transformation in the healthcare sector that directly benefits the wider community, which has an impact on healthcare services and public health in general. The next limitation is that the results of the latent class analysis with PLS-POS of this study obtained unobserved heterogeneity, so it is recommended that this finding be followed up in further research to identify what attributes exist in the respondent segment or what factors differentiate the segment. This is needed to obtain homogeneous response data with certain criteria so that the model's predictive ability can be more adequate. Another limitation of this study is that there may be other Big 5 personality traits that influence EMR adoption that cause the data to be insignificant, so I suggest that data moderation other than openness to experience, such as Consciousness, can be conducted in research on EMR adoption for healthcare workers.

Conclusion

This study revealed that management support, patient safety climate, and adequate training had a significant positive effect on perceived usefulness and perceived ease of use of EMR, which is consistent with previous studies. Strong management support and positive safety climate encourage EMR adoption by providing resources and promoting a safety culture. Adequate training and physician involvement also increase EMR ease of use. Openness to Experience was found to negatively moderate the relationship between perceived usefulness and EMR adoption, but strengthen the relationship between perceived ease of use and EMR adoption, indicating that individuals with high levels of openness tend to be more critical but also more adaptive to new technologies. These findings extend the TAM theory by emphasizing the importance of personality factors in EMR implementation strategies. This study also confirms the relevance of perceived usefulness and perceived ease of use in EMR adoption in type C hospitals in Indonesia, strengthening the external validity of the TAM theory.

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