



## Analysis of Factors Associated with the Use of an Electronic Medical Record Information System Based on the Technology Acceptance Model (TAM)

I Wayan Pasek Tekayana\*, Ni Luh Putu Dina Susanti, Luh Gde Nita Sri Wahyuningsih, Ni Putu Noviana Sagitarini

Master of Nursing, Faculty of Health, Institut Teknologi dan Kesehatan Bali, Jl. Tukad Balian No.180, Renon, Denpasar Selatan, Denpasar, Bali 80227, Indonesia

\*[pasekjhon@gmail.com](mailto:pasekjhon@gmail.com)

### ABSTRACT

A crucial sector in the Health system which is included in the 6 pillars of Health transformation is Health technology transformation. Health technology transformation has a role in utilizing technology and biotechnology in the health sector. One use of technology in health services globally is the use of Electronic Medical Records (RME). Technology acceptance model (TAM) is used to predict the use and acceptance of an information system and technology by individual users, which will influence the success or failure of implementing a new information system. The purpose of writing this literature review is to analyze factors related to the use of electronic medical records Technology acceptance model (TAM). Method: The method used in this writing is a literature review. The research articles used were obtained through a literature search using an online database, namely Google Scholar, which was published from 2019 to 2024. The keywords used in the database search were "Electronic Medical Records", "Technology acceptance model (TMA)". After selecting the relevance of the content of the articles with the focus of this writing, 10 articles were obtained that were relevant to the writing of this literature study. The research articles used were obtained through a literature search using online databases, namely Google Scholar, Pubmed and Science Direct, which were published between 2019 and 2024. The keywords used in the database search were "Electronic Medical Records", "Technology acceptance model". Results: Four factors were found that were related to the use of the Electronic Medical Record Information System, namely perceived ease of use, perceived usefulness, attitude to use (actual system usage), desire or interest to use (behavioral intention to use). Individual characteristics such as gender, age and work experience do not have a significant effect on the relationship between perceived usefulness, perceived ease, attitude towards using and desire to implement electronic medical records.

Keywords: information system; medical record; technology acceptance model

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## INTRODUCTION

The National Health System (SKN) is health management carried out by all components of the Indonesian nation in an integrated and mutually supportive manner to ensure the achievement of the highest level of public health (Presidential Decree No. 72, 2012). In order for the level of public health in Indonesia to be achieved, there are 5 (five) priority programs from the government, namely improving maternal, child and reproductive health, accelerating improvements in community nutrition, increasing disease control, cultivating a healthy community movement and strengthening the health system, as well as controlling drugs and food. After the Covid-19 pandemic passed, the five programs were transformed through 6

(six) Health transformation pillars. A crucial sector in the Health system which is included in the 6 pillars of Health transformation is Health technology transformation (Flores et al., 2013).

Health technology transformation has a role in utilizing technology and biotechnology in the health sector. One use of technology in health services globally is the use of Electronic Medical Records (RME). Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2022 concerning Medical Records, it is stated that the definition of a medical record is a document containing patient identity data, examinations, treatment, actions and other services that have been provided to the patient. Meanwhile, electronic medical records (RME) are medical records created using an electronic system intended for maintaining medical records. Since the Republic of Indonesia Minister of Health Regulation Number 24 of 2022 was issued, every health service facility is required to maintain electronic medical records (RME). However, more than 80% of health service facilities in Indonesia have not been touched by digital technology, so the use of RME is not evenly distributed (Ministry of Health of the Republic of Indonesia, 2021). In the 2024 Health Digital Transformation Strategy, the Ministry of Health also added that the next challenge to improve the quality of Health services is to improve the quality of Health Human Resources (HRK) by increasing the capabilities and use of information technology in the Health sector (Sepri & Fauzi, 2022).

Technology acceptance model(TAM) is a theory introduced by Davis in 1989, which is specifically for modeling user acceptance of technology. In his research Kassiuw et al. (2023) adding TAM is used to predict the use and acceptance of an information system and technology by individual users, which will influence the success or failure of implementing a new information system. The level of acceptance of information technology use in TAM is determined based on four factors, namely perceived ease of use, perceived usefulness, attitude to use (actual system usage), and desire or interest to use (behavioral intention to use) (Azzahro & Nugraha, 2023). The implementation of the use of RME in health services is expected to provide benefits in improving the quality of health services. Therefore, it is necessary to consider what factors are related to it Use of an Electronic Medical Record Information System Based on the Technology Acceptance Model (TAM). The purpose of writing this literature review is to analyze factors related to the use of electronic medical records Technology acceptance model(TAM).

## **METHOD**

The method used in this writing is a literature review, where this method is used to identify and evaluate research results and thoughts produced by practitioners and researchers. The research articles used were obtained through a literature search using online databases, namely Google Scholar, Pubmed and Science Direct, which were published between 2019 and 2024. The keywords used in the database search were "Electronic Medical Records", "Technology acceptance model" 1,370 articles were obtained. A further 473 articles were obtained using the keywords "factors related to the use of electronic medical records" and "technology acceptance model". Next, filtering was carried out again and 29 articles were obtained, then further identified by filtering the relevance of the content of the articles to the focus of this writing so that 10 articles were obtained that were relevant to the writing of this literature study.

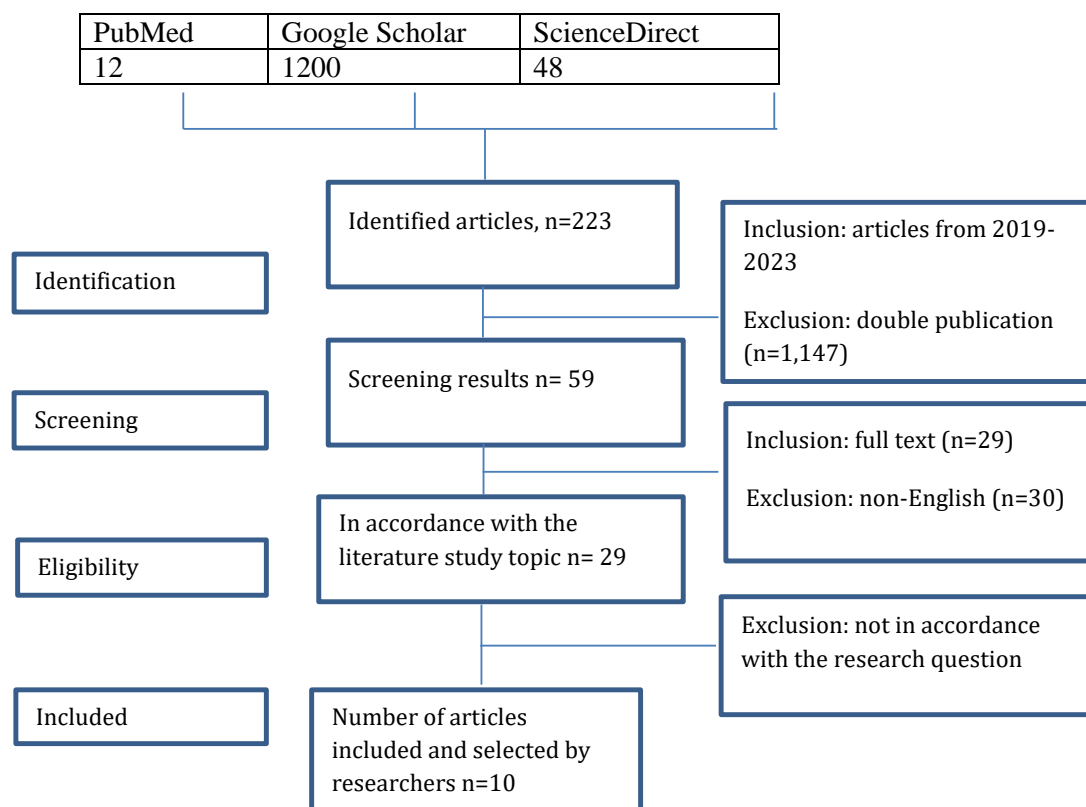


Figure 1. PRISMA-based flow diagrams

**RESULTS**

Table 1.

The results of the literature review conducted on ten articles are as follows:

Author and Year	Research methods, samples, variables, instruments, analysis	Analysis Results
(Kassiww et al., 2023)	Research Design: <i>literature review</i> . Samples: 12 articles Independent Variable: the role of the Technology acceptance model method. Dependent Variable: implementation of electronic medical records	Perceived benefits of use and ease of use of electronic medical record systems are factors that influence intentions to accept and use electronic medical records. The implementation of electronic medical records is a solution to the limitations of conventional medical records, so it is necessary to focus on solving various challenges in implementing electronic medical records, and strengthening the benefits that arise from implementing electronic medical records.
(Sugiharto et al., 2022a)	Research Design: analytical survey with a cross sectional approach. Samples: 120 nurses on duty at the Dr. RSUP polyclinic. Kariadi. Instruments: The questionnaire contained demographic data on nurses and variable indicators with answer choices using a Likert scale. Analysis: <i>Structural Equation Modeling-Partial Least Square (SEM-PLS)</i>	There are three factors that influence nurses' attitudes towards using RME, namely perceived usefulness, perceived ease and social influence. Facilitating conditions have no effect on attitudes towards using RME. RME that has been implemented can be accepted without barriers of age, gender and length of service for nurses.
(Maryati, 2021)	Research design: quantitative observational with a cross-sectional study approach. Samples: 80 health workers at the Husada Hospital Specialist Clinic. Independent variable: perceived	The test results show that there is no relationship between perceived ease of use and EMR use, and there is a relationship between perceived usefulness and behavioral interest and EMR use. The benefits felt by users with EMR are more efficient time and energy. In terms of

Author and Year	Research methods, samples, variables, instruments, analysis	Analysis Results
	usefulness, perceived ease of use, and behavioral interest Dependent variable:the effect of using electronic medical records. Analysis:Pearson correlation and multiple linear regression analysis	perceived convenience, the average score was 36.79, several problems were still found, including network errors or patient data not appearing. The behavioral interest score in using EMR is 20.55, meaning that interest in using EMR is quite good.
(Dhea Soraya et al., 2022)	Research design:literature review using the PRISMA method Sample:12 articles	Factors that influence the acceptance of hospital information systems and electronic medical records are perceived benefits, ease of use, environmental influences, technological factors, interest and effort.
(L Nainggolan & Liana, 2023)	Research design:quantitative analysis method with a cross sectional approach. Sample:144 specialist doctors. Independent Variable: <i>Information System Success Model and the Technology Acceptance Model</i> Dependent Variable:Behavioral Intention of Specialist Doctors to use electronic medical records. Instruments:questionnaire with answer choices using a Likert scale. Analysis: <i>Structural Equation Modelling(SEM)</i>	Factors that influence the use of EMR are system quality, ease of use, and perceived benefits. The more benefits felt in increasing productivity, the higher the user's intention to use EMR.
(Intansari et al., 2023)	Research design:quantitative analysis method with a cross sectional approach. Sample:771 EMR users at Hospital Independent Variable:User attitudes towards EMR Dependent Variable:perceived ease of use and perceived usefulness of the system Instrument:questionnaire with answer choices using a Likert scale. Analysis:bivariate correlation test	there is a positive relationship between the belief that Electronic Medical Records (RME) can be used easily (perceived ease of use) and benefits in performance performance and performance productivity (perceived usefulness), electronic medical records can provide benefits in performance performance and performance productivity (perceived usefulness ) and attitudes toward using RME (Attitude toward using). The belief that RME can be used easily (perceived ease of use) has a positive and significant effect on the attitude toward using RME (Attitude toward using) as well as a significant relationship between the belief that the attitude toward using EMR (Attitude toward using) and is significant on actual use of EMR. usage).
(Triadi & Widyaningrum, 2023)	Research design:quantitative analysis method with a cross sectional approach. Sample:19 people Independent Variable:EMR implementation Dependent Variable:quality of service at RSU PINDAD Bandung City Instrument:questionnaire Analysis:chi-square analysis	The majority of 19 respondents who used electronic medical records rated “Very Good” (10.5%), “Good” (57.9%), “Normal” (26.3%), or “Fairly Good” (5.3% ). The chi-square test shows there is a relationship between the distributed nature of EMR and service quality. The research conclusion is that the implementation of EMR has a major impact on the quality of services provided at the PINDAD General Hospital in Bandung City.
(Alhur, 2023)	Research design:cross-sectional descriptive-analytic study Sample:350 nurses Independent Variable:Use of electronic medical records Dependent Variable:nurses' perceptions Instrument:questionnaire	Electronic medical records are useful for helping nurses in carrying out their duties. The use of electronic medical records is easy to do so that it influences the provision of high quality, efficient and effective care to patients.

Author and Year	Research methods, samples, variables, instruments, analysis	Analysis Results
	Analysis:Pearson's correlation coefficient	
(Almarzouqi et al., 2022)	Research design:cross-sectional design Sample:259 respondents from 15 Health facilities in Dubai. Independent Variable:Individual behavioral intentions regarding EMR Dependent Variable:use of the EMR system Instrument:survey questionnaire Analysis:Simple linear regression test	Research data proves that intention to use an EMR system is the most influential and predictor of actual system use. Individual behavioral intentions regarding EMR have also been shown to have a positive influence on EMR system use. Perceived ease of use by doctors has a direct influence on their perceived usefulness of mobile EMR so that both influence EMR use.
(Sulistyo et al., 2020)	Research design:cross-sectional descriptive-analytic study Sample:30 officers who use an electronic medical record information system Independent Variable:subjective norms, image, relevance of work, quality of results, visibility of results Dependent Variable:perceived usefulness, perceived ease of use, user interest, usage behavior of users of the electronic medical record information system at the Gamping I Community Health Center Instrument:questionnaire Analysis:Simple linear regression test	There is no influence of subjective norms, description, relevance of work, quality of results, appearance of results on perceived usefulness, perceived ease of use, user interest, usage behavior of users of the electronic medical record information system at the Gamping I Community Health Center

## DISCUSSION

### Perceived Ease of Use

Results of research that has been carried out (Sugiharto et al., 2022a) Perception of convenience has a significant effect on attitudes towards using RME. This is in line with research that has been carried out(Intansari et al., 2023),The belief that EMR can be used easily (perceived ease of use) has a positive and significant effect on the belief that EMR can provide benefits in terms of performance and performance productivity (perceived usefulness) and the value  $r = 0.771$  is obtained, which means there is a very strong relationship that EMR can used easily (perceived ease of use) can provide benefits in terms of performance and performance productivity (perceived usefulness).(L Nainggolan & Liana, 2023)explains that perceived convenience has a significant influence on the use of RME. The level of convenience of an information system encourages continuous use of information systems because it can provide convenience and speed up work. The easier it is to use electronic medical records, the higher the attitude of nurses to use electronic medical records in documenting nursing care. But in research(Intansari et al., 2023)10.5% of respondents stated that they did not agree that RME was easy to access. This can happen becauseThere is still a lack of network at several points, such as in the operating room and ICCU inpatient room at Hospital The results of this research are in line with the statement by the Indonesian Ministry of Health (2021) that 80% of health service facilities in Indonesia have not been touched by digital technology, so the use of RME is not evenly distributed. This requires efforts to improve access to EMR, apart from that there is a need for training to use EMR in health service units to improve performance and productivity.

### Perceived Usefulness (Perceived Usefulness)

EMR can provide benefits in performance performance and performance productivity (perceived usefulness) has a positive and significant effect on attitudes towards using EMR (Attitude toward using) with a value of  $r = 0.747$ , which means there is a strong relationship

that EMR can provide benefits in performance performance and performance productivity (perceived usefulness) has a positive and significant effect on attitudes towards using EMR(Intansari et al., 2023). This is in line with research(Alhur, 2023)33% of respondents said their work would be more difficult if they did not use RME.Electronic medical records are useful for helping nurses in carrying out their duties.Sugiharto et al. (2022)also addedPerceived usefulness has a significant effect on attitudes towards using RME. The higher the benefits of electronic medical records felt by nurses, the higher the attitude of nurses to use electronic medical records in documenting nursing care. Nurses' acceptance of electronic medical records is necessary for the integration of electronic medical record systems with patient-focused care activities. The RME development team needs to consider aspects of usefulness in each RME application development so as to encourage nurses' attitudes to always use RME in documenting their nursing care (Mustika Aji Nugroho et al., 2020).

#### **Attitude To Use (Actual System Usage)**

Research resultsSugiharto et al. (2022)shows that attitudes towards using RME have a significant effect on RME use.Intansari et al. (2023)expressed the belief that the attitude towards using EMR (Attitude toward using) has a positive and significant effect on actual use of EMR (actual usage) with a value of  $r = 0.717$ , which means there is a strong correlation between the variable use of medical records and actual use of electronic medical records. The quality of a system and the convenience obtained by using the system can influence the use of the system so that these two things need to be maintained for the continued use of the information system. One of the obligations of nurses in carrying out nursing practice is to document nursing care according to standards. Nurses document their nursing care in the medical record (paper/electronic) immediately after the patient receives nursing care. The use of RME is mandatory, but it is not impossible for variations in its implementation to occur. Nurses may not fully use RME if they feel that existing facilities are inadequate, especially if there is no supervision from leadership (Jalatria et al., 2023).

#### **Desire or Interest to Use (Behavioral Intention To Use)**

Perceptions of the benefits of using and ease of use of electronic medical record systems are factors that greatly influence the intention to accept and use electronic medical records(Kassiaw et al., 2023). In line with research conducted by(L Nainggolan & Liana (2023),The more benefits felt in increasing productivity, the higher the user's intention to use EMR.Almarzouqi et al. (2022)confirmthat user intention and motivation is one of the factors that most influences the success of RME implementation. Ease of use of electronic medical records plays an important role in determining the intention of health workers to use this information system in carrying out their work (Chen & Lou, 2002).

#### **Subjective Norms, Overview, Relevance of Work, Quality of Results, Appearance of Results on Attitudes to Using RME**

Research resultSulistyo et al. (2020)there is no significant effect betweenSubjective Norms, Description, Relevance of Work, Quality of Results, Appearance of Results on the use of RME. These results are similar to research conducted bySugiharto et al. (2022)thatgender, age and work experience of nurses do not moderate the relationship of facilitating conditions to attitudes towards using RME. These results illustrate that there is no difference between male and female nurses, younger or older nurses and nurses with longer or less work experience in perceiving the influence of facilitating conditions on attitudes towards using RME. This could be because the use of RME is mandatory so that nurses of different ages, genders and experiences will still try to have a good attitude towards using RME (Maloni et al., 2021).

## **CONCLUSION**

Four factors were found that were related to the use of the Electronic Medical Record Information System, namely perceived ease of use, perceived usefulness, attitude to use (actual system usage), desire or interest to use (behavioral intention to use). Electronic medical records are expected to be a solution to the problems and limitations that arise from the use of conventional medical records which still use paper. Implementation of the use of electronic medical records (RME) has great benefits for improving the quality of health services. However, there are several obstacles that influence the use of electronic medical records, including the ability of human resources to utilize technology and the uneven distribution of digital technology facilities in health services so that the use of electronic medical records is not optimal. Individual characteristics such as gender, age and work experience do not have a significant effect on the relationship between perceived usefulness, perceived ease, attitude towards using and desire to implement electronic medical records. This shows that the RME that has been implemented can be accepted without barriers of age, gender and length of service for nurses. The attitude towards using RME is proven to influence the use of RME.

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