



Evaluation of the implementation of electronic medical records in Lubuk Buaya Padang Public Health Center in 2023

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ABSTRACT

The importance of electronic medical records aims to improve the quality of health services, provide legal certainty in the administration and management of medical records, guarantee the security, confidentiality, integrity and availability of medical record data; and realizing the implementation and management of digital-based and integrated Medical Records. Based on the results of observations in the field, several community health centers in Padang City conducted comparative studies with the Lubuk Buaya Community Health Center. This public health center is an example of a community health center that has implemented electronic medical records. This research aims to evaluate the use of electronic medical records at the Lubuk Buaya Padang Public Health Center in 2023. The research method uses a quantitative approach with the Performance, Information, Economic, Control, Efficiency, Service (PIECES) method. Sampling was carried out using a total sampling technique. Research data was collected by distributing questionnaires regarding the use of electronic medical records. The results of the variable or dimensional analysis show that the aspects with an average level of satisfaction for each performance are 3.76 (satisfied), information is 3.67 (satisfied), economics is 3.75 (satisfied), Control is 3.11 (doubtful), efficiency is 3.86, (satisfied) and service 3.89 (satisfied). Of the six dimensions, all answered that they were satisfied with the implementation of electronic medical records except for the Control dimension which was still unsure. It is recommended that the Puskesmas need to improve control aspects so that the implementation of electronic medical records becomes of higher quality.

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1. INTRODUCTION

Public Health Centres is one of the first-level health service facilities, so the provision of health services needs to utilize appropriate technology so that it suits needs, and services and is easy to use. Health service management refers to the planning, implementation, and monitoring evaluation stages. Apart from that, Puskesmas also organizes registration and reporting activities related to health data and information (Permenkes RI, 2014). In

accordance with PMK no. 24 of 2022, every health service facility is required to implement Electronic Medical Records (RME) in December 2023. Electronic medical records (RME) are a digital version of conventional medical records (in paper form) that are commonly used in health facilities. Electronic Medical Records contain notes and information collected by and for doctors at the health service facility.

The electronic medical record arrangement aims to improve the quality of health services, provide legal certainty in the administration and management of medical records, guarantee the security, confidentiality, integrity and availability of medical record data; and realize the implementation and management of digital-based and integrated Medical Records. Electronic Medical Records are one of the subsystems of the Health Service Facility information system which is connected to other information subsystems in the Health Service Facility. Electronic Medical Records are maintained from the time the patient is admitted until the patient goes home, is referred, or dies. Health Service Facilities must develop standard operational procedures for the implementation of Electronic Medical Records tailored to the needs and resources of each Health Service Facility, by referring to the Electronic Medical Record guidelines (Permenkes RI, 2022).

Electronic health recording systems have the potential to improve the quality of health services, especially through the availability of health information (Gesulga et al. 2017). Implementation of electronic medical records at Community Health Centers can produce accurate and standardized reporting data so that health services become effective and efficient so that disease outbreaks in the community can be immediately addressed and resolved (Dona et al, 2019). Electronic medical records are an effort to find out a person's disease history with the aim of knowing how to control a disease. (Sidik 2022)

Currently electronic medical records are used for reporting, administration, finance and documentation of patient services. Currently, RME is still being developed to suit user needs (Andriani, et al, 2022). Before an electronic medical record system is adopted, issues such as access to health data, legal framework, and access to consent must be considered, and practical solutions must be available (Ayatollahi et al, 2014).

The transformation of health technology is realized through the development and use of technology, digitalization and biotechnology. In Indonesia itself, the health sector has implemented technology and digitization through medical records. Unfortunately, the use of Electronic Medical Records in Indonesian health service facilities is not yet fully distributed. Based on data from the Directorate of Referral Health Services, there are only 74 out of 575 hospitals in Indonesia that implement integrated Electronic Medical Records. Not only that, not all applications are optimal (Nurfitriani, et al. 2022).

Many factors influence the implementation of Electronic Medical Records in terms of people, costs, devices, materials and methods used. It is hoped that the implementation of Electronic Medical Records will be evenly distributed throughout Indonesian health service facilities. This is due to the many benefits of Electronic Medical Records, especially from a bioethical perspective (Meilia et al., 2019). In the implementation of electronic medical records, there are also obstacles that can affect the running of health services at the Community Health Center, such as: internet network interference and bridging problems with Pcare BPJS so that users or officers are hampered in inputting service data and can also disrupt health service activities at each polyclinic.

It is hoped that the implementation of electronic medical records in Community Health Centers can contribute to Community Health Centers in increasing the effectiveness and efficiency of health services. The advantage of the PIECES method compared to other methods is that the analysis using this method is carried out completely and is very suitable for evaluating the use of a system. The results of the PIECES method analysis will later reveal weaknesses or shortcomings in the system,

which can later become recommendations for system improvements that can be developed further or to improve the previous system (Mulyani dan Fatoni 2021).

Based on initial observations at the Lubuk Buaya Padang Community Health Center, electronic medical records have been implemented in early 2023. Based on the results of field observations, several community health centers in Padang City have conducted comparative studies with the Lubuk Buaya Community Health Center. Lubuk Buaya Community Health Center is an example of implementing electronic medical records. Even though it is a pilot health center in using electronic medical records, it is also necessary to evaluate the application of electronic medical records to officers as users. This evaluation is needed to determine user satisfaction in using electronic medical records in providing health services to patients.

2. RESEARCH METHOD

An observational design was used in this research using a descriptive design using the PIECES framework method. PIECES Framework is a framework used to classify problems, opportunities and directives contained in the scope definition section of system analysis and design. With this framework, new things can be produced that can be taken into consideration in system development. The PIECES method consists of Performance, Information/data, Control/security, Efficiency, Service. Each of these categories can be further divided into several criteria (Tullah et al, 2014).

The research was conducted in July-September 2023 at the Lubuk Buaya Padang Community Health Center. This research sample corresponds to the entire population, using the total sampling method. The total sampling method is that the entire population is the research object in the population. A sample is a portion of the population selected in a certain way so that it is considered representative or representative of the population. The sample should meet the desired criteria. The desired sample (intended sample, eligible subjects) is part of the target population that will be studied directly (Adiputra dkk, 2021) The population in this study are people who often use the electronic medical record application at the Lubuk Buaya Padang Community Health Center. The total sample was 18 people. The research instrument is to use a questionnaire. The questionnaire is structured in the form of questions that will be answered by the respondent. By providing a questionnaire and the data from the questionnaire can be quickly analyzed. The data includes assessment scores based on Performance, Information, Economy, Control, Efficiency and Service (PIECES).

The results of the questionnaire assessment of the evaluation of the implementation of electronic medical records used a Likert scale. To get the average level of satisfaction, use the average satisfaction formula (Muliansah dan Budihartanti 2020). To determine the level of satisfaction using the model defined by Kaplan and Norton with levels 1 – 1.79 (Very Dissatisfied), 1.8 – 2.59 (Not Satisfied), 2.6 – 3.39 (Undecided), 3.4 – 4.91 (Satisfied), 4.92 – 5 (Very Satisfied) (Asbar dan Saptari 2017). As for the question items for the Performance, Information, Efficiency, Control and Economics dimensions, there are 4 questions each. Meanwhile, in the Service dimension there are 5 questions. Answer choices can be seen in the table below:

Alternative Answer	Weight Value	
	Positive	Negative
a. Very Good (SB)	5	1
b. Good (Good)	4	2
c. Satisfactory (M)	3	3
d. Fairly Good (CB)	2	4
e. Not Good (KB)	1	5

Subsequently, it is recapitulated and calculated using the Likert scale with the following formula (Asbar dan Saptari 2017):

$$AS = \frac{TQS}{TQ}$$

Where:

AS = Average average satisfaction

TQS = Total Questionnaire Score

TQ = Total of Questionnaire

3. RESULTS AND DISCUSSIONS

The use of electronic medical records is useful for simplifying the work of medical record officers, speeding up data searches, improving the quality and productivity of work in hospitals. When using electronic medical records, officers simply input data into an application or system so they don't need to record identity repeatedly. Apart from being easier to use, data in electronic medical records can be updated with new data results consistently and can be accessed again for the benefit of patient care if they seek treatment again (Rosalinda et al, 2021). However, due to the many benefits of implementing electronic medical records, it is also necessary to evaluate the implementation of electronic medical records in this health service facility. This aims to ensure that the services provided to patients run effectively and efficiently.

Based on the results of an evaluation survey on the implementation of electronic medical records at the Lubuk Buaya Community Health Center, user satisfaction was measured using a Likert scale. Researchers distributed research questionnaires to respondents by distributing questionnaires to users of electronic medical records at the Lubuk Buaya Community Health Center. Researchers determine the answers in the questionnaire so that respondents can choose one answer to answer. The questionnaire has been distributed in paper form to 18 respondents so that the data obtained from the questionnaire can be processed and analyzed so that researchers can obtain research results using Microsoft Excel. In this research there are 6 variables, namely: Performance, information, economy, control and security, efficiency, and service.

In the Performance dimension aspect, there are 4 questions including; The available menu options make it easier for me to use the program, the menus and navigation provided can be executed easily and interactively, the available menus can instantly bring up information according to what I need, and instructions for canceling commands are available easily when needed. In the Information dimension aspect, there are 4 questions including; The electronic medical record application is easy to use, the electronic medical record application requires a complicated data input process, the electronic medical record application is easy to learn, and the output produced is easy to read.

In the Economic dimension aspect, there are 4 questions; The electronic medical record application speeds up work completion (time efficiency), the electronic medical record application has accurate results (target efficiency), the electronic medical record application saves operational costs (cost efficiency), and by using the electronic medical record application, work becomes easier to complete (efficiency of energy and thought). In the Control aspect, there are 4 questions including; The electronic medical record application never experiences errors when used, the electronic medical record application is free from viruses, the data search process is fast, and existing data cannot be changed by users other than staff (data security is guaranteed).

In the Efficiency aspect, there are 4 questions including whether the electronic medical record application meets needs, whether the electronic medical record application provides information that is relevant to regulations, whether the electronic medical record application is used in all organizations/public health centers agencies, and the electronic medical record application provides various benefits for the organization. The final aspect, namely Service, has 5 questions including; The electronic medical record application can be used easily. Each submenu in the Registration menu can be accessed easily. Information can be accessed easily. Using the Search feature to search for patient data easily, and the program is equipped with a system for correcting/updating patient data.

The following are the results of the level of user satisfaction with the electronic medical record application based on the 6 (six) dimensional aspects assessed which can be seen as follows:

Table 3. Average User Satisfaction of Electronic Medical Record Applications based on 6 aspects

Question Dimensions	Question					Average	Level of Satisfaction
	P1	P2	P3	P4	P5		
<i>Performance</i>	3,94	3,83	3,67	2,61		3,76	Satisfied
<i>Information</i>	4,06	2,78	3,78	4,06		3,67	Satisfied
<i>Economics</i>	3,72	3,67	3,89	3,72		3,75	Satisfied
<i>Control</i>	2,33	3,39	3,33	3,39		3,11	Undecided
<i>Efficiency</i>	3,83	3,72	4,00	3,89		3,86	Satisfied
<i>Service</i>	3,89	4,06	3,78	4,00	3,72	3,89	Satisfied

Information :

P = question

Based on the results of calculating the highest average number of satisfaction, a score of 3.89 was obtained in the Service aspect with the level of user satisfaction with the electronic medical record application at the Community Health Center in the Satisfied category. The lowest score is in the Control aspect with an average score of 3.11 and the level of satisfaction category is uncertain. The average value for the Performance aspect is 3.76 with a satisfaction level of Satisfaction. This shows that users of the electronic medical record application at the community health center are satisfied. The results are the same as research by Wahyuni (2023), research by Muliansah dan Budihartanti (2020) that the category of user satisfaction level with the e-Puskesmas system is included in the satisfied category.

From the results of the interview with the head of medical records, he also said that the menu options available in the application make it easier to input data. From the questionnaire, the answers to the performance aspect questions were mostly answered well on the question, the available menu options made it easier for me to use the program and the available menus instantly brought up information according to what I needed. The average value of the Information aspect is 3.67 with a satisfaction level of Satisfaction. This shows that users of electronic medical record applications at community health centers are satisfied regarding the information aspect. From the questionnaire answers to questions on the Information aspect, the highest scores were on questions 1 and 2, namely that the RME application was easy to use and easy to learn. The results are the same as research by Wahyuni (2023) and research by Muliansah dan Budihartanti (2020) that the category of user satisfaction level with the e-Puskesmas system is included in the satisfaction category from the Information aspect. Health information obtained from the health information system used can improve the quality of health services provided to patients and optimize the overall use of health resources (Gunawan, 2018).

The average score for the Economy aspect is 3.75 with a satisfaction level of Satisfaction. This shows that users of electronic medical record applications at community health centers are satisfied from an economic aspect. From the questionnaire answers to questions on the Economy aspect, the highest score was in question 3, namely the application of RME saves operational costs (cost efficiency). The results are the same as research by Wahyuni (2023), research by Muliansah dan Budihartanti (2020) that the category of user satisfaction level with the e-Puskesmas system is included in the satisfaction category from the Economic aspect.

The average value of the Control aspect is 3.11 with an undecided level of satisfaction. This shows that users of electronic medical record applications at community health centers are still hesitant in terms of the control aspect. From the questionnaire answers to the Control aspect questions, the highest scores were in questions number 2 and 4, namely that the RME application is free from viruses and existing data cannot be changed by users other than officers (data security is guaranteed). This shows that users answered in doubt regarding satisfaction with using the electronic medical record application at the community health center. The results are the same as Wahyuni's (2023) research on the Control variable. The average level of satisfaction was obtained with a value of 3.21 in the doubtful category, different from the results of Muliansah dan Budihartanti (2020) research which stated that the category of user satisfaction level with the e-Puskesmas system was included in the category satisfied from the Control aspect.

The results of Putra's research (2018) found that the implementation of e-Puskesmas was considered good, although in the implementation of e-Puskesmas there were still several problems with the network such as speedy connections which were not optimal, in addition to the security of access to e-Puskesmas using username and password accounts together, as well as long patient waiting times due to network problems. From the research results of (Sofia et al. 2022), there are several techniques used by health facilities to maintain the security of electronic medical records in ensuring privacy aspects, namely implementing logins with usernames and passwords, implementing automatic log off, cryptographic technology, and blocking access to data using network technology.

The average value of the Efficiency aspect is 3.86 with a satisfaction level of Satisfaction. This shows that users of electronic medical record applications at community health centers are satisfied in terms of the efficiency aspect. From the questionnaire answers to questions on the Efficiency aspect, the highest score was in question number 3, namely the application of electronic medical records used in all health center organizations/agencies. The results are the same as Wahyuni's (2023) research and the results of Muliansah dan Budihartanti (2020) research that the user satisfaction level category with the e-Puskesmas system is included in the satisfaction category from the Efficiency aspect.

The average value of the Service aspect is 3.89 with a satisfaction level of Satisfaction. This shows that users of the electronic medical record application at the community health center are satisfied in terms of the service aspect. From the questionnaire, the answer to the Service aspect question has the highest score in question number 2, namely that every submenu in the registration menu can be accessed easily. The results of this research are in line with research by (Ayatollahi et al. 2014) that to improve the quality of health services it is necessary to have standard service data applications so that they can be accessed easily and are available when needed.

At the beginning of the implementation of RME, it functioned to replace manual medical records, namely supporting administrative functions and documentation of patient services. Along with development, the RME function also includes financial and reporting functions. Until now, administration and management functions are still a priority. The development of RME has been oriented toward patient safety with the use of

warning features for allergy detection, drug-drug interactions, and drug-disease interactions (Rika Andriani et al. 2022). The information presented must truly have useful value (Muliansah dan Budihartanti 2020).

From the results of interviews with the head of medical records, the problems or obstacles that arise from implementing electronic medical records at the Lubuk Buaya Community Health Center are network problems. The network is down due to a power failure. However, this problem can be overcome by turning on the cellphone hotspot. Apart from that, the puskesmas also provide generators. This is the same as research by Goldstein et al. (2014) that one of the factors inhibiting the implementation of web electronic information systems is the lack of wireless internet network connectivity which has an impact on the efficiency of service quality. The internet has a range of capabilities used by organizations to exchange information internally or to communicate externally with other organizations (Khristianto et al. 2015) According to Asadi et al. (2015) the quality of the internet network affects the integrity of data reports as health information can be accessed nationally if all the necessary infrastructure is adequate and available.

Electronic medical records help provide service efficiency by minimizing waiting times. Patients don't have to wait long just because they are waiting for the manual distribution of medical records. The speed of service which is influenced by the speed of distribution of manual medical records can be increased by using RME. RME also supports ease of access because it can be accessed simultaneously by different authorized users. The efficiency of patient care can be improved for other things by developing several features that do not yet exist.

By using RME, hospitals or health centers can track and provide information about the patient data needed at the desired time or at any time when we need information about patient data (Kamal et al, 2020). In accordance with research results (Andriani et al, 2017). that users feel satisfied and confident that using electronic medical records can increase the benefits of electronic medical records for their work. This is proven by the benefits felt by respondents, namely ease and speed of access, ease of communication, and service efficiency. Users better understand the benefits and impact of RME on work when these benefits can be felt directly (Gagnon et al. 2014).

4. CONCLUSION

The implementation of electronic medical records plays a very important role and provides convenience for users. Evaluation of the implementation of electronic medical records at the Lubuk Buaya Community Health Center, Padang City using the PIECES method. Calculation and analysis of data on all PIECES Framework variables is considered very effective in analyzing data so that the system can be evaluated more deeply. The results of the variable or dimensional analysis show that the aspects with an average level of satisfaction for each performance are 3.76 (satisfied), information is 3.67 (satisfied), economics is 3.75 (satisfied), Control is 3.11 (doubtful), efficiency is 3.86 (satisfied) and service 3.89 (satisfied). The implication and contribution of this research is the results of data on user satisfaction in implementing electronic medical records at the Lubuk Buaya Community Health Center. On average, users answered that they were satisfied, but there was one aspect related to control, the answer was still uncertain. It is recommended to the Lubuk Buaya Padang Community Health Center to implement electronic medical record services while still paying attention to aspects that are categorized as good, and need to improve control aspects so that the implementation of electronic medical records at the Community Health Center ensures that health services become effective and efficient.

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