



Effectiveness Analysis Of The BPJS Patient Admission Workflow In The Implementation Of Electronic Medical Records (EMR) At The Outpatient Registration Unit Of RSUD Sayang Cianjur

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Abstract

This study aims to analyze the effectiveness of the BPJS patient admission workflow following the implementation of the Electronic Medical Record (EMR) system in the outpatient registration unit, specifically regarding service speed, data accuracy, and adherence to Standard Operating Procedures (SOPs). This is a descriptive qualitative study utilizing an observational approach. Data were collected through direct observation of the BPJS patient registration workflow; interviews with registration staff, IT personnel, and patients; and a review of SOP documentation and system reports. The implementation of the EMR system proved effective in enhancing BPJS patient registration services. Results indicate that the EMR implementation improved the effectiveness of the BPJS patient admission workflow; registration time decreased from an average of 12–15 minutes to 6–8 minutes per patient due to the integration of the EMR with VClaim and the Mobile JKN queue system for verifying SEP (Participant Eligibility Letter), eligibility status, and fingerprints. Patient data accuracy also improved. Enhancements are needed regarding network infrastructure (including backup internet), the refinement of SOPs to better integrate the EMR with BPJS systems, and continuous training for registration staff to optimize EMR usage, thereby making the BPJS patient admission workflow more effective and efficient.

Keywords: Effectiveness, BPJS Patient Registration, EMR, Outpatient Care

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1. Introduction

Digital transformation in the health sector has become a national requirement under Regulation of the Minister of Health of the Republic of Indonesia No. 24 of 2022 concerning Medical Records. Under this regulation, all health service facilities are required to fully implement Electronic Medical Records (EMR). The main objective of EMR implementation is to improve efficiency, accuracy, data security, and the quality of health services.

RSUD Sayang Cianjur, a hospital owned by the Regional Government of Cianjur Regency and the area's main referral hospital with a high service capacity, has transitioned from a conventional registration system to an integrated EMR system. The Outpatient Registration Unit is at the forefront of this implementation, as it is the patient's first point of contact with the hospital.

The greatest challenge in this unit is the dominance of BPJS Kesehatan (national health insurance) patients, who account for more than 75% of total outpatient visits. The BPJS patient admission workflow is far more complex than that for general patients. Staff are required not only to input patient identity into the EMR, but also to carry out a bridging process with the BPJS Kesehatan system, including checking membership status, validating online referrals, issuing the Participant Eligibility Letter (Surat Eligibilitas Peserta/SEP) through VClaim, and verifying fingerprints through the FRISTA system.

Based on the researcher's preliminary observations in the Outpatient Registration Unit of RSUD Sayang Cianjur [author to specify month of observation], a gap was found between the ideal objectives of EMR and actual field conditions. EMR implementation, which is intended to speed up services, instead caused queue build-ups during peak service hours (07:30–10:00 WIB). This was attributed to several factors: 1) the bridging process between the EMR and BPJS VClaim was not yet stable and often pending; 2) staff had to perform double entry, inputting data twice into two different applications; 3) limited adaptation among patients, particularly elderly patients, to the biometric verification system; and 4) limited network infrastructure.

As a result, waiting times for BPJS patients at registration often exceeded the hospital's Minimum Service Standard (Standar Pelayanan Minimal/SPM) of < 10 minutes, affecting patient satisfaction and the service image of RSUD Sayang Cianjur. An effectiveness analysis was therefore needed to assess whether the new EMR-based BPJS patient admission workflow has been running effectively, and to identify aspects requiring evaluation.





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2. Research Method

This research is a descriptive study using a qualitative approach. Qualitative descriptive research aims to describe and analyze in depth the effectiveness of the BPJS patient admission workflow in the implementation of Electronic Medical Records (EMR) at the Outpatient Registration Unit of RSUD Sayang Cianjur, as it actually occurs in the field.

The research was conducted at RSUD Sayang Cianjur, specifically in the Outpatient Registration Unit, over a two-month period from April to May 2026.

The subjects of this study were 8 informants, consisting of:

- a. 1 Head of the Outpatient Installation: to understand the policy and supervision of EMR implementation in the outpatient unit.
- b. 1 Outpatient Registration Counter Coordinator: to understand staff workflow and coordination at the counter.
- c. 1 Outpatient Registration Counter Staff member: as the direct implementer of the patient registration process using EMR.
- d. 1 Hospital IT Staff member: to understand technical aspects, system constraints, and EMR network support.
- e. 1 Medical Record Staff member (registration section): to understand the process of recording and managing electronic patient data.
- f. 1 BPJS Verification Officer: to understand the BPJS membership verification process integrated with EMR.
- g. 2 Outpatients: as service users, to understand patient perceptions and experiences regarding the registration service.

Data obtained from all informants were analyzed thematically to identify patterns, themes, and perceptions related to the effectiveness, challenges, and proposed solutions in the implementation of EMR at RSUD Sayang Cianjur.

The research consisted of five stages. The first stage was preparation, in which the researcher identified the problem through a preliminary study in the Outpatient Registration Unit of RSUD Sayang Cianjur, determined the research focus and objectives, prepared the proposal, selected informants, and prepared research instruments (interview guidelines, observation sheets, and documentation). The researcher also obtained the required research permits before data collection.

The second stage was data collection, carried out through observation, in-depth interviews, and documentation. The researcher first directly observed the BPJS patient admission workflow and EMR use, then interviewed the 8 selected informants to obtain information on service implementation, EMR effectiveness, constraints, and supporting and inhibiting factors. Documentation was used to complement the data obtained from observation and interviews.





The third stage was data analysis. Data obtained from observation, interviews, and documentation were processed using the analysis model of Miles, Huberman, and Saldaña (2020), comprising data condensation, data display, and conclusion drawing and verification. In the condensation stage, data were selected and grouped according to the research focus; the data were then presented in narrative or matrix form for ease of understanding, followed by conclusions drawn from the patterns and findings obtained.

The fourth stage was verification and data validity, in which the researcher compared interview results with observation and documentation results, and compared information across informants. This process used source and technique triangulation to ensure that the data obtained corresponded to actual field conditions.

The final stage was the compilation of research results, in which the researcher organized and described the analysis findings on the effectiveness of the BPJS patient admission workflow in EMR implementation, including constraints, supporting and inhibiting factors, and conclusions and recommendations based on the research findings.

3. Results and Discussion

a. Result

Advances in information technology have had a major impact across various fields, including the health sector. One of the most prominent innovations is the implementation of the EMR system within hospitals. This transformation affects not only administrative aspects but also the patient service workflow, particularly for outpatients. The following section outlines several key points based on the research findings regarding EMR implementation in outpatient services.

1) Description of the Outpatient Workflow Before EMR Implementation

Before EMR was implemented at this hospital, the entire patient registration process was carried out manually. New patients were required to fill out a registration form, while for returning patients, staff searched for data through printed medical record files in the filing room. This process often took around 3 to 5 minutes per patient, depending on queue conditions and file availability.

Staff reported that service delays frequently occurred due to the time needed to search for files, and errors in recording patient identity also occurred with high frequency. In addition, the main complaint from patients was long queues in the morning. The outpatient workflow before EMR implementation at the registration unit is described below.



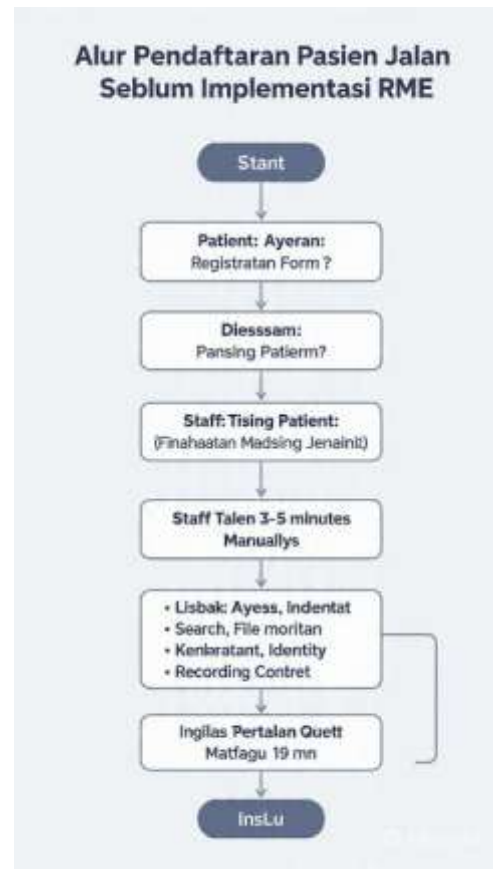


Figure 1. Patient Registration Workflow Before EMR Implementation

a) New Patients

New outpatients arrive at the hospital with a queue number. Registration staff record the patient's identity and provide a general consent form to be completed. After the form is filled out and signed, the patient's file is handed directly to the data-entry officer for information input. The file is then sent by the distribution officer to the intended clinic (poli) for further service. Before EMR implementation, registration could only be carried out in person at the hospital, and no online queuing service was yet available.

b) Returning Patients

Returning outpatients, or those previously registered, arrive at the hospital with a queue number. Registration staff record patient data based on the medical record number or BPJS membership number. The patient's file is then placed in a basket, which the distribution officer collects to search for the patient's medical record file in the filing





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storage room. Once the medical record is found, the file is handed to the data-entry officer for input of patient information, including name, place and date of birth, age, gender, initial diagnosis, and intended clinic. The completed file is returned to the basket and sent by the distribution officer to the intended clinic for further service.

2) Description of the Outpatient Workflow After EMR Implementation

After the adoption of EMR, most patient information can be accessed through a fully digitalized computerized system. For existing patients, data is retrieved by entering the medical record number or the patient's name into the EMR application; for new patients, registration can be carried out directly and electronically by the staff on duty. However, not all processes have been fully digitalized — consent signatures for medical procedures are still obtained manually. Although all units are connected, some medical record forms are still in the process of being integrated with the system; this integration is currently being handled by a third party, so this stage is simply awaiting completion of the work queue. In addition, technical obstacles are still frequently encountered, such as slow connections, network disconnections, and insufficient training for new staff. The outpatient workflow after EMR implementation at the registration unit is described below.





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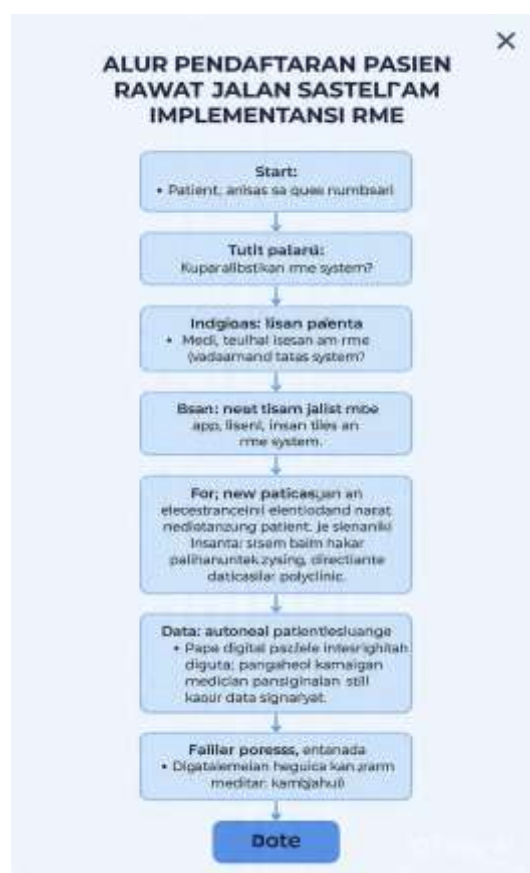


Figure 2. Outpatient Patient Registration Workflow After EMR Implementation

a) New Patients

Patients arrive at the hospital and print a queue number for new patients via the queuing machine, then register at the counter. Staff request the patient's identity documents, such as an ID card (KTP) or BPJS card. Once the data is received, staff input the patient's identity and intended clinic into the hospital information system, then print the Participant Eligibility Letter (SEP). After the SEP is printed, the patient is asked to complete a face scan; if the patient is unable to do so, a fingerprint scan may be used instead. The patient is then directed to wait for service at the intended clinic.

b) Returning Patients

Returning patients arrive and print a queue number for returning patients. Staff search for the patient's identity data using the medical record number or BPJS number. Once the patient's data is located, this information, along with the intended clinic, is entered into the system. Staff then print the SEP; after printing, the patient completes a





face scan, or a fingerprint scan if unable to do so, and is then directed to wait for service at the intended clinic.

c) Patients Who Have Registered via the Mobile JKN Application

Patients who have registered online via the Mobile JKN application can go directly to the counter or to the Self-Service Registration Kiosk (Anjungan Pendaftaran Mandiri/APM) to register themselves on the day of the visit without queuing at the counter — simply scanning a barcode or BPJS card, then printing the SEP and the clinic queue number.

3) Perception of the Effectiveness of EMR Implementation

Based on interviews with several informants, the majority of registration staff and health workers stated that the use of EMR provides significant convenience in the patient registration procedure. According to them, EMR reduces administrative workload, particularly in data recording that was previously done manually. Through the electronic system, data input can be performed more quickly and accurately, minimizing the recording errors commonly found in manual systems. Staff also stated that they found it easier to access patient information thanks to the EMR system; digitally stored patient data allows staff to quickly verify and search for data, thereby speeding up the service process and reducing patient waiting times. This efficiency benefits not only staff but also positively affects patient satisfaction, as patients feel they receive more responsive and structured service.

Nevertheless, some informants also reported obstacles in adopting EMR, particularly among staff not yet accustomed to computerized technology. Adapting to the new system requires time and training; the majority of staff stated that the training provided was not yet sufficient to build a thorough understanding of all system-use procedures. Further, more intensive and continuous training is therefore needed so that all staff can use the system effectively and efficiently.

There are also ongoing concerns about potential dependency on the electronic system, particularly in the event of technical disruptions such as server or network failures, which could hinder service continuity and cause inconvenience for both health workers and patients. Hospital management therefore needs to provide adequate and reliable technical support to ensure system continuity, including support ready to handle incidents arising from such disruptions. Overall, perceptions of EMR implementation effectiveness tend to be positive, although success remains highly dependent on the readiness of human resources and of the infrastructure supporting a sustainable system. With adequate training





and a reliable system, EMR has considerable potential to improve service quality, particularly at the registration unit of RSUD Sayang Cianjur.

4) Analysis of Changes in Service Time

Based on observations and interviews with patients receiving service, average service time decreased significantly, from a previous 11–25 minutes per patient to 3.0–5 minutes after EMR implementation. This improvement reflects greater efficiency in searching for patient data, updating data input, and transferring data to the clinic. In certain situations, however, such as when a system error occurs, service time can take longer, approaching conditions similar to those before EMR implementation.

Table 3. Significant Changes in Outpatient Registration Service Time

Service Stage	Before EMR	After EMR	SPM Standard
Queue number retrieval	3–5 minutes	30 seconds	≤ 2 minutes
Patient data search	5–10 minutes	10–20 seconds	≤ 1 minute
Data input/update & BPJS verification	3–5 minutes	1–2 minutes	≤ 3 minutes
Ticket printing & referral to clinic	1–5 minutes	Instant (real-time)	≤ 1 minute
Total average time	11–25 minutes	2–4 minutes	≤ 10 minutes

Based on Table 3, a significant change can be seen in outpatient registration service time following implementation of the Electronic Medical Record (EMR) system. Before EMR implementation, the patient data search process required 5–10 minutes; after EMR was adopted, this time decreased drastically to only 10–20 seconds. This indicates that the patient data search process became far more efficient, as data can now be accessed automatically through the system.

The process of inputting or updating patient data also became more efficient, decreasing from 3–5 minutes to 1–2 minutes. Meanwhile, the stage of transferring data to the clinic, which previously took 1–5 minutes, can now be completed instantly (real-time) thanks to EMR system integration.

Overall, the average total registration service time decreased from 11–25 minutes to 2–4 minutes. These results indicate that EMR implementation has a significant positive impact on service efficiency, particularly in speed, accuracy, and patient data management at the outpatient registration unit. Beyond accelerating the administrative process, the system also helps reduce staff workload and increase patient satisfaction. Nevertheless, the evaluation also indicates a need for improvement in technical aspects, such as network stability and system feature optimization, so that EMR implementation can run more optimally across all hospital service units.





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**b. Discussion**

According to Regulation of the Minister of Health No. 24 of 2022, EMR implementation is part of the digital transformation of health services aimed at improving efficiency, security, and quality of service (Ministry of Health of the Republic of Indonesia, 2022). Based on the results of research conducted at the outpatient registration unit of RSUD Sayang Cianjur, EMR implementation has been shown to have a positive effect on the effectiveness of the patient admission workflow. Before EMR implementation, patient registration was carried out manually using paper forms and file searches in the filing room, resulting in longer service times, increased staff workload, and a fairly high risk of recording errors. After EMR implementation, the entire administrative and patient-data recording process became digitally integrated, improving efficiency and speed in patient data management.

Observation results show that patient registration service time decreased significantly, from 11–25 minutes per patient before EMR to approximately 1.5–3.5 minutes after implementation. This reduction demonstrates that the EMR system is highly effective in accelerating service. The process of transferring data to the clinic can now also be carried out in real time through the system, reducing queues and patient waiting times at the counter.

Beyond time efficiency, effectiveness is also reflected in improved data security and accuracy. The EMR system allows patient data to be stored properly and retrieved easily without risk of losing files, helping staff ensure the accuracy of patient identity and reducing the likelihood of duplicate data entry. Registration staff interviewed stated that the system eases their administrative workload and increases their productivity.

In terms of ease of use, most staff found the EMR system easy to operate after an adaptation process. However, in the early stages of implementation, obstacles such as network disruptions and insufficient training for new staff were still encountered, indicating that infrastructure readiness and continuous training are important factors in maintaining smooth system operation.

Another notable indicator is user satisfaction, both among staff and patients: patients report faster and more orderly service, while staff feel more efficient in carrying out their duties. This change reflects an overall improvement in service effectiveness at the outpatient registration unit.

Overall, EMR implementation at RSUD Sayang Cianjur is considered effective in improving time efficiency, data accuracy, ease of work processes, and user satisfaction. Although technical obstacles remain, the resulting benefits far outweigh those of the previous manual system. Sustaining this effectiveness will require continued investment





in human-resource training, network infrastructure maintenance, and routine evaluation of EMR system performance.

4. Conclusion

The results of the research and observations conducted at RSUD Sayang Cianjur indicate that EMR implementation at the outpatient registration unit has a significant positive impact on the efficiency and quality of health services. The system simplifies the process of searching for and managing patient data, directly helping to reduce waiting times compared with the manual system. EMR also improves the accuracy of data recording and supports staff performance by reducing administrative workload and minimizing the potential for input errors.

In general, user perceptions — among both health workers and patients — indicate a high level of satisfaction with the ease of use, speed of access, and data security offered by the system. Even so, several technical obstacles remain, such as network disruptions and limitations in certain features, which need to be addressed promptly for operations to run more optimally.

Overall, EMR implementation not only improves health-worker productivity but also improves the patient experience and accelerates the accuracy of medical decision-making. Continuous system development through training, technology infrastructure improvement, and optimization of EMR use is therefore an important step in addressing future challenges. It is recommended that RSUD Sayang Cianjur continue conducting regular evaluations of the system to identify and resolve emerging technical obstacles, strengthen human-resource capacity through routine training, and reinforce network infrastructure and data security to protect patient information. Collaboration among the IT team, medical staff, and management is key to sustaining the success of EMR implementation as a whole.

5. Compliance With Ethical Standards

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Disclosure of conflict of interest

The authors declare that they have no conflict of interest, financial or personal, that could inappropriately influence or bias the conduct and publication of this research.





Statement of informed consent

Informed consent was obtained from all individual participants included in this study. All informants were fully informed regarding the purpose, procedures, and potential risks of the research prior to their participation.

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