



# Electronic Medical Records (EMR) For Nursing Documentation: A Concept Analysis

Muhammad Sulaiman<sup>1,\*</sup> Arifudin Arifudin<sup>2</sup> Rib'hanul Hakim<sup>3</sup>

<sup>1,2,3</sup> Universitas Muhammadiyah Semarang, Semarang, Central Java 50273, Indonesia  
muhammadsulaiman270592@gmail.com

**Abstract.** Electronic medical records (EMR) have revolutionized the healthcare landscape as a digitized rendition of conventional (paper-based) medical records, prominently adopted across various health facilities. These digital archives encapsulate a plethora of records and information meticulously curated by healthcare personnel within the facility, primarily aimed at facilitating the process of diagnosing and treating patients' health conditions. Nursing documentation, an integral aspect of healthcare practice, entails the comprehensive recording of all activities pertaining to the nursing process. It serves as a vital tool benefiting not only clients but also nurses and collaborative partners. The process of documenting nursing activities encompasses a series of interconnected actions that form an uninterrupted cycle spanning various stages including assessment, nursing diagnosis, intervention, implementation, and evaluation. This manuscript aims to conduct a thorough concept analysis of electronic medical records (EMR) nursing documentation, delving into its antecedents, attributes, and consequences, supported by empirical references. Additionally, the elucidation of concepts will be augmented through the utilization of case models, borderline instances, and contrary cases. Furthermore, the quality of nursing documentation will be assessed employing the D-Cacth instrument, contributing to a deeper understanding of its efficacy and implications within healthcare settings.

Keywords: Concept Analysis, Electronic Medical Records (EMR), Nursing Documentation.

## 1. Introduction

Hospitals serve as vital institutions offering a spectrum of healthcare services encompassing outpatient, inpatient, and emergency care [1]. Within these facilities, the nursing profession plays a pivotal role in delivering essential patient care [1,2]. However, despite the critical function of nurses, concerns persist regarding the perceived quality of their services, leading to widespread dissatisfaction [3]. Nursing documentation, an integral aspect of healthcare practice, involves the systematic recording of activities pertinent to the nursing process, serving the interests of clients, nurses, and collaborative partners alike [4]. This

documentation process entails a cohesive sequence of interrelated activities forming an uninterrupted cycle spanning assessment, nursing diagnosis, intervention, implementation, and evaluation [5–7]. Nevertheless, challenges persist in traditional paper-based documentation methods, including issues related to legibility, time consumption, and financial constraints associated with paper procurement [8].

The transition to electronic documentation emerges as a promising alternative, addressing many of the shortcomings of paper-based systems [9]. In Indonesia, the documentation system has evolved to embrace the 3S (SDKI, SLKI, SIKI) framework, reflecting a shift from the previous 3N (NANDA, NOC, NIC) model [7]. This transition necessitates theoretical comprehension and clinical proficiency among nursing students to effectively adapt to the new standards and contribute to the enhancement, prevention, and restoration of health outcomes for clients, families, and communities [10,11].

Amidst the contemporary era's rapid information proliferation, the healthcare sector has witnessed significant advancements, particularly in the realm of information technology [12]. EMR exemplify one such advancement, offering a digital alternative to traditional paper-based medical records. EMRs streamline record-keeping processes, enabling healthcare providers to track patient data longitudinally, identify individuals for preventive care initiatives, and monitor patient progress more effectively [13]. Moreover, the utilization of EMRs translates into cost efficiencies, eliminating expenses associated with printing and storage.

## **2. Purpose**

The aim of this concept analysis is to provide a comprehensive elucidation of EMR as a tool facilitating nurses in executing streamlined, efficient, and accountable nursing documentation. Additionally, the analysis seeks to explore the concept by delineating its antecedent components, attributes, and consequential implications within the nursing practices.

## **3. Methods**

The methodological framework for conducting concept analysis in this study draws upon the conceptual model proposed by Walker & Avant [14]. According to this model, there are eight sequential stages involved in concept analysis: 1) Selecting a concept; 2) Determine the objectives of the analysis; 3) Identify all possible uses of the concept; 4) Determine attribute definitions; 5) Identify a model; 6) Identify borderline cases, related cases and contrast cases; 7) Identification of antecedents and consequences; and 8) Establish empirical references. Data for this study were gathered from diverse sources, including various scholarly databases accessible through Google Scholar. The search for relevant literature encompassed journal articles published between 2015 and 2023, written

in either English or Indonesian, focusing on the definition and utilization of Electronic Medical Records (EMR). The search terms employed were "EMR" and "nursing documentation."

## **4. Results and Discussion**

The articles utilized in this concept analysis span various disciplines within scientific inquiry. Among these, there is a particular focus on articles addressing the concept of EMR within the nursing field. This discussion will delineate the stages of concept analysis in accordance with Walker & Avant's model [14], proceeding sequentially as follows:

### **4.1. Choose a Concept**

The EMR concept of nursing documentation was chosen in the theoretical analysis based on the phenomenon that electronic medical records are an electronic device that has an important role in improving the quality of care, ensuring the quality and convenience of information, and increasing patient satisfaction. Minister of Health Regulation Number 24 of 2022 explains that electronic medical records must meet three principles of data and information security [15], such as: *principle of confidentiality* (the principle of confidentiality aims to ensure that data and information are protected from access by unauthorized parties), *principle of integrity* (the principle of integrity aims to maintain the accuracy of data and information, so that only people who have access rights can make changes to the data), *availability principle* (the principle of availability gives priority to the availability of information when connected with related parties. medical records are a communication tool that must always be available appropriately and be able to display data that has been previously stored).

### **4.2. Determining the objectives of the analysis**

This concept analysis was conducted to develop an operational definition of EMR in nursing documentation. The aim is to identify all uses of the concept and to provide direction for research related to EMR in nursing documentation in order to improve the quality of nursing documentation.

### **4.3. Identify all uses of the concept**

A comprehensive literature search encompassing various scientific fields was conducted to elucidate the characteristics of the concept, as advocated by Walker & Avant [14]. This approach allows for a nuanced understanding of the concept, considering diverse perspectives from different scientific domains. The focus of the literature search was directed towards the concept of EMR within the realm of nursing documentation.

EMR, as conceptualized in nursing documentation, represents a digital adaptation of

traditional paper-based medical records commonly utilized in healthcare facilities [16]. These digital archives store records and information compiled by healthcare professionals within the facility, serving the purpose of diagnosing and treating patient ailments [17]. EMRs offer numerous advantages, including the ability to track patient data longitudinally, identify individuals for preventive and screening measures, and enhance overall healthcare quality [16,18]. Moreover, EMRs are cost-efficient, eliminating expenses associated with printing and storage [19]. They play a pivotal role in enhancing the efficiency and quality of services across various healthcare settings, improving accuracy, form, ease of use, service speed, and facilitating case management and collaboration among healthcare professionals. Consequently, EMRs have the potential to significantly enhance the delivery of quality healthcare services, reducing waiting times, ensuring continuity of care, minimizing redundant examinations, and augmenting service efficiency [17–19].

Nursing documentation, on the other hand, involves the meticulous recording of all activities related to the nursing process, serving the interests of clients, nurses, and collaborative partners. This documentation process comprises a series of interrelated activities forming an unbroken cycle from assessment, nursing diagnosis, intervention, implementation, to evaluation stages [18,20]. Recognized as a crucial aspect of nursing practice, documentation serves as a vital proof of performance for nurses [21]. However, conventional paper-based documentation methods pose various challenges, including readability issues, time constraints, and financial burdens associated with paper procurement [22]. Consequently, the adoption of electronic documentation emerges as a more suitable and promising alternative [21,23].

Hence, within the context of nursing documentation, EMR serves as a digital system adept at storing information pertaining to the recording of nursing activities. This system facilitates an interconnected cycle spanning assessment, nursing diagnosis, intervention, implementation, and evaluation stages, thereby catering to the needs of clients, nurses, and collaborative partners [21].

#### **4.4. Determine Attributes**

Determining attributes stands as a fundamental step within the concept analysis procedure. This phase is critical as it entails defining the characteristics or attributes that constitute the concept. These identified attributes serve to distinguish one concept from another. Walker & Avant emphasize the importance of identifying attributes that delineate the concept of EMR nursing documentation [14]. Documentation of nursing care that applies in several hospitals in Indonesia generally still uses written documentation. The nursing information system is a combination of computer science, information science and nursing science which is designed to facilitate management and the process of retrieving information and knowledge used to support the implementation of care. Nursing information systems relate to the legality of obtaining and using data, information and knowledge regarding documentation standards, communication, supporting decision-making processes,

developing and disseminating new knowledge, improving the quality, effectiveness and efficiency of nursing care and empowering patients to choose the desired health care, includes:

### **Completeness**

According to Minister of Health Regulation Number 269 of 2008 regarding medical records, it is mandatory for every doctor or dentist engaged in medical practice to maintain medical records for health services. This obligation extends to hospitals, which are required to uphold medical records standards. Medical records must be promptly created and diligently completed subsequent to the patient's receipt of services. Each entry within the medical record should include the name, timestamp, and signature of the attending doctor, dentist, or specific healthcare personnel directly involved in administering health services [24].

Medical records contain notes and documents that explain the patient's identity, examination, treatment, actions and other services provided to the patient. These medical records can be made in writing, or electronically to ensure completeness and clarity of their contents [24]. Electronic recording of medical records includes demographic data, medical data and other supporting data which have been integrated in one input. Good documentation has uniform standards, rules for maintaining data, clear writing, legibility of writing, validation and input provided, not writing too late, input format accuracy and completeness of data. A medical record is said to be complete if it contains at least the patient's biographical and biographical data [25].

Complete and accurate medical records serve multifaceted purposes, acting as a crucial resource for healthcare services, legal documentation, quality improvement initiatives, medical research endeavors, and as a foundation for evaluating hospital performance. According to Minister of Health Regulation Number 129 of 2008 concerning Minimum Service Standards for Hospitals, medical records are considered complete if they have been diligently filled out by the attending doctor within 24 hours following the provision of services, both for inpatient and outpatient cases. However, despite regulatory standards, many hospitals still struggle to achieve completeness in their medical records. For instance, Sumber Waras Hospital reported a completion rate of 73% in 2018 indicating a significant gap in adherence to the prescribed standards. Similarly, Panembahan Senopati Bantul Regional Hospital achieved a completion rate of 98% in 2019, suggesting varying levels of success among healthcare facilities in meeting the requirements outlined by regulatory authorities [26].

### **Caring**

Caring is a form of nurse concern for clients as a form of attention, appreciation and being able to meet their needs [27]. The phenomenon that four out of five clients interviewed stated that nurses were not caring enough for clients. Nurses' lack of caring is characterized by the nurse's lack of concern for the client, so that the client complains that the nurse in

the room does not pay enough attention to the client's comfort. The electronic nursing documentation system is a good system if implemented in Indonesia because it is more efficient, many nursing actions require along time, this of course reduces nurses' time in writing and makes nurses more caring towards clients, but this is a challenge for nurses in meeting client needs. various obstacles that can be experienced such as human resources, the need for training and hospital service systems in using management information systems [28].

### **Effectiveness**

The use of electronic-based nursing documentation is very effective for nurses. The development of knowledge is so fast, nurses will quickly be left behind if they do not take advantage of various things to adapt to the latest developments [19]. Knowledge is the result of knowing and this occurs after someone senses a particular object. The use of records in the handover process improves communication in conveying necessary information and effectively prevents errors [29].

### **Efficiency**

Efficiency is an approach to achieving goals by using minimal resources but producing maximum results. Implementation of electronic nursing documentation can improve the quality and efficiency of health service provision [18,20]. That the implementation of EMR reduces the use of paper and medical record folders, thus shows that the implementation of EMR affects the efficiency of costs spent by hospitals on medical record units [30].

## **4.5. Create a case model**

Creating a case model is an attempt to explain each characteristic of the concept in the exemplary case. Cases can come from facts that occur in the environment, literature and the results of the case model described below come from observations that occur in the environment.

A nurse in charge of patients in the internal medicine room, has worked in that room for 7 years, before the nurse carried out documentation at EMR the nurse provided nursing care to the patient by giving attention, respect and being able to meet their needs which included assessment, formulating a diagnosis, formulating interventions, carrying out nursing implementation and nursing evaluation. Before entering the EMR system the nurse enters the user and password into the EMR, after that during the patient assessment the nurse enters the patient data into the EMR system, including collecting patient demographic data, such as name, date of birth, address and contact information, after the patient data entered into EMR, it will automatically be distributed to various related parties, such as doctors, nurses and other health facilities that provide medical services to patients.

The nurse performs input after obtaining data from reviewing medical information about the patient, including medical history, examination results, diagnosis, drug prescriptions, and other medical procedures. Nurses also make input in formulating nursing diagnoses, making nursing interventions, implementing and evaluating nursing. After nurses and those providing care to patients make input in the EMR, the documents written by the Doctor in Charge of the Patient (DPJP) will be verified. Nurses also input the costs of actions carried out by nurses on patients and Consumable Goods (BHP) used by patients into the EMR. Nurses can also check patient transaction costs for funding claims from insurance or certain health programs. EMR in hospital nurses work is stored on an encrypted internal server, thereby preventing the risk of loss or damage.

The case model presented includes all attributes. A nurse in charge of patients in the internal medicine room has worked in that room for 7 years. Before the nurse carried out documentation in the EMR, the nurse carried out comprehensive nursing care which included assessment, formulating a diagnosis, formulating interventions, carrying out nursing implementation, and nursing evaluation. **Patient registration:** during the patient assessment, the nurse enters patient data into the EMR system, including collecting patient demographic data, such as name, date of birth, address and contact information. **Distribution of EMR data:** Patient data entered into EMR will automatically be distributed to various related parties, such as doctors, nurses and other health facilities that provide medical services to patients. **Filling in clinical information:** The nurse inputs after obtaining data from reviewing medical information about the patient, including health history, examination results, diagnosis, drug prescriptions, and other medical procedures. Nurses also provide input in formulating nursing diagnoses, creating nursing interventions, implementing and evaluating nursing. **Processing EMR information:** nurses and those providing care to patients input EMR and the documents written by DPJP will be verified. **Inputting data for financing claims:** Nurses also input the costs of actions carried out by nurses on patients and consumables used by patients into the EMR. Nurses can also check patient transaction costs for funding claims from insurance or certain health programs. **EMR Storage:** Before entering the EMR system, the nurse enters the user and password into the EMR and the EMR in the hospital where nurses work is stored on an encrypted internal server, thereby preventing the risk of loss or damage.

#### 4.6. Conceptualize borderline and contrary cases

Creating borderline cases aims to explain examples where some characteristics of the concept are not present in the case. Meanwhile, contrary cases are cases that do not describe the concept in question because there are no characteristics of the concept at all.

##### **Borderline case**

A nurse who is responsible for patients in the surgical room has worked in that room for 10 years. Before the nurse carried out documentation in the EMR, the nurse carried out nursing care which included formulating a diagnosis, formulating interventions, carrying

out nursing implementation and nursing evaluation. Before entering the EMR system the nurse enters the user and password into the EMR, after that during the patient assessment the nurse enters the patient data into the EMR system, including collecting patient demographic data, such as name, date of birth, address and contact information, after the patient data entered into EMR, it will automatically be distributed to various related parties, such as doctors, nurses and other health facilities that provide medical services to patients. Nurses make inputs after getting the data. Nurses also make inputs in formulating nursing diagnoses, making nursing interventions, implementing and evaluating nursing, after nurses and those providing care to patients make inputs in the EMR, the documents written by the doctor in charge of the patient will be verified by DPJP.

The case model presented does not include all attributes. A nurse in charge of patients in the internal medicine room has worked in that room for 10 years. The nurse did not provide complete nursing care, the nurse did not carry out direct assessments and did not enter the correct data into the EMR and not inputting the costs of actions carried out by nurses on patients and consumables.

### **Contrary case**

A nurse implementing the internal medicine room, has worked in that room for 2 years, the nurse does not carry out documentation in the EMR. The nurse carries out nursing care which includes assessment, formulating a diagnosis, formulating interventions, carrying out nursing implementation and nursing evaluation. Before entering the EMR system the nurse enters the user and password into the EMR belonging to another implementing nurse friend, after that during the patient assessment the nurse enters incorrect patient data into the EMR system, including collecting patient demographic data, such as name, date of birth, address, and contact information, after patient data is entered into EMR it will automatically be distributed to various related parties, such as doctors, nurses and other health facilities that provide medical services to patients.

The nurse performs input after obtaining data from reviewing medical information about the patient, including medical history, examination results, diagnosis, drug prescriptions, and other medical procedures. Nurses also make input in formulating nursing diagnoses, making nursing interventions, implementing and evaluating nursing, after nurses and those providing care to patients make input in the EMR, the documents written by DPJP will be verified.

Nurses also input the costs of actions carried out by BHP used by patients into the EMR. Nurses can also check patient transaction costs for funding claims from insurance or certain health programs. EMR in hospital nurses work is stored on an encrypted internal server, thereby preventing the risk of loss or damage.

The case model presented does not describe the concept in question because there are no characteristics of the concept at all. A nurse implementing the internal medicine room, has



worked in that room for 2 years, the nurse does not carry out documentation in the EMR, the nurse carries out nursing care and the nurse does not carry out complete nursing care, the nurse does not carry out direct assessments and does not enter the correct data into the EMR and the nurse enters the user and password into the EMR belonging to another implementing nurse friend.

#### **4.7. Identify antecedence and consequences**

##### **Antecedent**

Antecedents are factors that have occurred previously that influence the attributes that are characteristic of the concept Walker & Avant [14]. Antecedents in EMR nursing documentation are factors that influence the condition of EMR nursing documentation, including knowledge, education, motivation, supervision, facilities [31–34]:

##### **Knowledge**

Knowledge is a very important domain in the formation of a person's actions. So, a person's practice can be influenced by knowledge, education, cultural influences and mass media. This opinion is supported by previous study that states that knowledge is a very important domain for the formation of one's actions, knowledge will encourage one's practice. Knowledge is very influential in the EMR filling process, this is in accordance with research journals which state that there is a significant influence between nurses' knowledge and the completeness of Electronic Medical Records with a very strong correlation. Outpatient Installation at Prof. Dr. R.D Kandou Manado Hospital [35].

##### **Education**

Education is a planned basic effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, morals, life sciences, general knowledge and the skills they need for society based on the Laws. A high level of education will influence a person's individual knowledge as well as an increase in filling out medical record files [31].

##### **Motivation**

Motivation is the driving force that causes a member of an organization to be willing and willing to surrender abilities in the form of expertise or skills, energy and time to carry out various activities that are their responsibility and fulfill their obligations in order to achieve the goals and various targets of the organization that have been determined previously, there are important three points in understanding motivation: the relationship between needs, drives and goals. Needs arise because there is something that a person lacks, both physiological and psychological. Encouragement is a direction to fulfill these needs, while the goal is the end of a motivation cycle. Motivation is divided into 2 according to Herzberg's theory, namely intrinsic motivation and extrinsic motivation. In this study, the extrinsic motivation that influences the documentation of nursing care is

stated, namely the protection of nurses in legal matters and the form of medical records in the form of EMR or electronic medical records. Where nurses need protection if legal problems arise which make it important for nurses to carry out complete documentation. Another motivation that supports nurses in documentation is intrinsic motivation in the form of nurses' sense of responsibility in the practice of documenting nursing care, assessing achievement and performance [30].

### **Supervision**

Supervision is an important part in the completeness of filling in medical record files and cannot be separated from service, this is proven by the more frequent supervision, the more impact it has on the completeness of filling in medical record files. Managing nursing care requires the ability of nursing managers to supervise. The head of the room is the frontline manager and the person in charge of the room must be able to be a good supervisor of the implementing nurse in an effort to complete the medical record file. The implementation of supervision that has not been optimal is in the head aspect. Supervision is the process of providing the resources needed by nurses to complete tasks in order to achieve goals in the form of guidance, guidance or supervision by managers regarding implementation from low, middle and upper levels in order to determine activities in accordance with the goals and objectives that have been set [32,33,36]

### **Facilities**

The role of Electronic Medical Records certainly has many roles, namely to store patient identity data when inputted into the Application, as well as patient Medical Record Numbers, patient reservations, drug prescriptions, viewing patient visit history and patient medical history, list of drug names and prices, consumables until the cashier. The role of Electronic Medical Records makes it easier for officers to provide services to patients so that they can help more effectively in providing services to patients. There are several factors that influence the effectiveness of electronic medical records, namely the network which sometimes suddenly becomes slower, the application suddenly errors while carrying out the service process so the officer must immediately contact customer service for repairs. However, electronic medical records also have benefits, including: they can increase productivity, are more efficient, it is very easy to issue patient medical records both in summary and in detail, and doctors and nurses can easily access patient data by logging in using their passwords [33,34,37]

### **Consequences**

Consequences are the outcome of the concept. The consequences of electronic medical record (RME) nursing documentation are the quality of nursing documentation.

### **Quality of nursing documentation**

Patient health records or medical records are the main work process of doctors and nurses and are the most important part of the patient information system which is needed to

improve patient safety, quality of care and work efficiency. As technology advances, so do documentation practices. Electronic records have made dramatic progress and have the potential to improve the quality of nursing care documentation [36]. Health services throughout the world have now switched to electronic health records and are starting to abandon paper health records. The benefits of electronic health records are well understood by hospital management and health workers, but the change process has experienced many obstacles. The shift in health care from paper to electronic has impacted not only the quality of nursing care documentation but also the broader organizational culture. Transformation must be supported as a whole in the organizational system so that this transition can run and be managed well because if it is not implemented well, it will cause poor service quality. Overall, EMR helps improve the quality of nursing documentation so that nursing documentation becomes complete and more comprehensive [36].

### **Satisfaction of medical record users**

User satisfaction in using electronic medical records is one measure of the level of success in implementing or using an information system. This satisfaction is an assessment regarding whether the performance of an information system is good or bad, and whether the information system used is suitable or not with the user's goals. Users are also the main key to the success of an information system implemented, because no matter how good a program or system is, it will not run well without support from users [32].

### **Quality of nursing care**

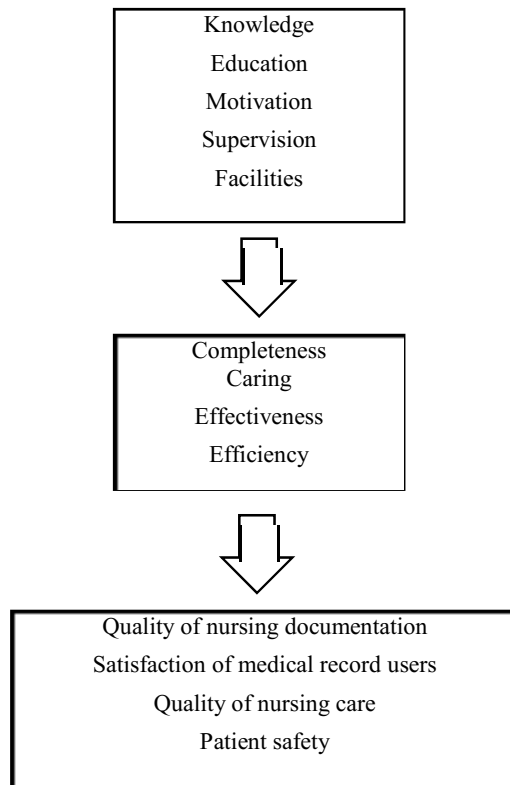
Recording complete and accurate patient data will make it easier for nurses to help patients solve patient nursing problems and can also find out the extent to which patient problems can be resolved. This is what will improve the quality of documentation of nursing care [21].

### **Patient safety**

The use of electronic nursing documentation can improve patient safety in hospitals if supported by good nursing competency and good infrastructure. In Jung's research, 84% of health facilities have used EHRs in the US, while in Korea, 50.2% of hospitals have used electronic-based documentation systems [38]. A study conducted by Charalambous and Goldberg explained that 76% of nurses believed that electronic-based documentation would improve patient safety. Information system support, infrastructure and good competency of nurses in using electronic nursing documentation can improve patient safety, be useful in ensuring safe care and treatment, reduce medication errors, increase data completeness, increase data sustainability, reduce nurse errors in the documentation process, improve communication in conveying necessary information, and effectively prevent errors in the handover process [39].

#### 4.8. Determining empirical referents

Empirical referents are tangible data points whose presence signifies the manifestation of a concept and can be utilized to identify the characteristics or attributes constituting that concept (Walker & Avant). In the context of assessing nursing documentation quality, the D-Cath instrument serves as a conceptual tool derived from previous research [31]. This instrument was developed by adapting and refining existing documentation quality assessment tools, specifically incorporating elements from the D-Catch instrument and Lunney's Scale for Degrees of Accuracy in Nursing Diagnoses. The D-Catch instrument, validated for its reliability and validity [40], offers a comprehensive evaluation of nursing documentation, encompassing various dimensions such as note structure, data acquisition, quality of nursing diagnoses and interventions, progress evaluation, and legibility.



**Fig 1.** Concept of the electronic medical record model (EMR) for nursing documentation.

Previous study demonstrated the D-Cath instrument's efficacy in assessing nursing care

quality with a high degree of accuracy. Psychometric evaluations conducted in the same study revealed a stable factorial structure, affirming the instrument's ability to provide reliable indicators of nursing documentation accuracy and overall care quality in hospital settings. Additionally, it also corroborated the suitability and recommendation of the D-Cacth instrument for utilization in documentation audit processes [40].

## **5. Conclusion**

The analysis of EMR nursing documentation reveals six key attributes: patient registration, MR data distribution, clinical information entry, EMR information processing, funding claim data input, and EMR storage, alongside factors influencing EMR conditions. Perceived usefulness, convenience, and social influence are integral components of EMR nursing documentation, significantly impacting its quality. The D-Cacth instrument emerges as a superior tool for assessing nursing documentation quality due to its comprehensive evaluation capabilities, including note structure alignment with the nursing care process, reception interview data analysis, assessment of nursing diagnoses and interventions, progress tracking, and legibility assessment. The theoretical definition, antecedents, attributes, and consequences of EMR nursing documentation have been elucidated. Continuous analysis and study are essential as this concept evolves, ensuring ongoing optimization and refinement of EMR systems for nursing documentation.

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## Reference

1. Zahaj M, Saliyaj A, Metani L, Nika S, Alushi E. Factors Related To Job Satisfaction Among Nurses. *European Scientific Journal*, ESJ 2016;12:100–100. <https://doi.org/10.19044/ESJ.2016.V12N5P100>.
2. Koch P, Zilezinski M, Schulte K, Strametz R, Nienhaus A, Raspe M. How Perceived Quality of Care and Job Satisfaction Are Associated with Intention to Leave the Profession in Young Nurses and Physicians. *International Journal of Environmental Research and Public Health* 2020, Vol 17, Page 2714 2020;17:2714. <https://doi.org/10.3390/IJERPH17082714>.
3. Seitovirta J, Lehtimäki AV, Vehviläinen-Julkunen K, Mitronen L, Kvist T. Registered nurses' perceptions of rewarding and its significance. *J Nurs Manag* 2018;26:457–66. <https://doi.org/10.1111/JONM.12571>.
4. Blair W, Smith B. Nursing documentation: Frameworks and barriers. *Contemp Nurse* 2012;41:160–8. <https://doi.org/10.5172/CONU.2012.41.2.160>.
5. Sonmez M, Gurlek Kisacik O, Author C. Perceptions of Turkish Nursing Students on Nursing Diagnose. *Clinical and Experimental Health Sciences* 2022;12:885–91. <https://doi.org/10.33808/CLINEXPHEALTHSCI.951967>.
6. Akay B, Akayl B, Köktürk B. The Relationship Between Nursing Students' Attitudes Towards Nursing Diagnosis and Their Professional Values. *Acıbadem Üniversitesi Sağlık Bilimleri Dergisi* 2023;14:257–63. <https://doi.org/10.31067/ACUSAGLIK.1208293>.
7. Sulistyawati W, Susmiati S. The Implementation Of 3S (SDKI, SIKI, SLKI) to The Quality Of Nursing Care Documentation In Hospital's Inpatient Rooms. *STRADA Jurnal Ilmiah Kesehatan* 2020;9:1323–8. <https://doi.org/10.30994/SJIK.V9I2.468>.
8. Zega M, D'Agostino F, Bowles KH, De Marinis MG, Rocco G, Vellone E, et al. Development and Validation of a Computerized Assessment Form to Support Nursing Diagnosis. *Int J Nurs Knowl* 2014;25:22–9. <https://doi.org/10.1111/2047-3095.12008>.
9. Primadilla H, Fitarina F, Metri D. Rekomendasi Desain Dokumentasi Keperawatan untuk Praktik Keperawatan Mandiri. *Jurnal Keperawatan Silampari* 2023;6:1244–55. <https://doi.org/10.31539/jks.v6i2.5177>.
10. Häyrynen K, Lammintakanen J, Saranto K. Evaluation of electronic nursing documentation-Nursing process model and standardized terminologies as keys to visible and transparent nursing. *Int J Med Inform* 2010;79:554–64. <https://doi.org/10.1016/J.IJMEDIINF.2010.05.002>.
11. Pearkao C, Impool T, Tantibundit P, Hongveang S, Potisopha W, Sampaonthong T. Development and Evaluation of a Web-Based Application for Trauma Nursing Documentation in Thailand: A Feasibility Study. *Journal of Trauma Nursing* 2023;30:41–7. <https://doi.org/10.1097/JTN.0000000000000698>.

12. Vazirani AA, O'Donoghue O, Brindley D, Meinert E. Blockchain vehicles for efficient Medical Record management. *Npj Digital Medicine* 2020 3:1 2020;3:1–5. <https://doi.org/10.1038/s41746-019-0211-0>.
13. Crameri KA, Maher L, Van Dam P, Prior S. Personal electronic healthcare records: What influences consumers to engage with their clinical data online? A literature review. *Health Information Management Journal* 2022;51:3–12. [https://doi.org/10.1177/1833358319895369/ASSET/IMAGES/LARGE/10.1177\\_1833358319895369-FIG1.JPEG](https://doi.org/10.1177/1833358319895369/ASSET/IMAGES/LARGE/10.1177_1833358319895369-FIG1.JPEG).
14. Walker LO, Avant KC. *Strategies for Theory Construction in Nursing*. Pearson Education Limited 2021:608.
15. Dachban YB, Sidi R, Saragih YM, Studi P, Hukum M, Universitas K, et al. Tinjauan Yuridis Kesiapan Rumah Sakit Dan Tanggungjawab Rumah Sakit Pasca Peraturan Menteri Kesehatan Nomor: 24/2022 Tentang Rekam Medis Dan Kesiapan Rumah Sakit. *Jurnal Ners* 2023;7:232–9. <https://doi.org/10.31004/JN.V7I1.13001>.
16. Scott IA, Pillans PI, Barras M, Morris C. Using EMR-enabled computerized decision support systems to reduce prescribing of potentially inappropriate medications: a narrative review. <https://doi.org/10.1177/2042098618784809> 2018;9:559–73. <https://doi.org/10.1177/2042098618784809>.
17. Msiska KEM, Kunitawa A, Kumwenda B. Factors affecting the utilisation of electronic medical records system in Malawian central hospitals. *Malawi Medical Journal* 2017;29:247–53. <https://doi.org/10.4314/MMJ.V29I3.4>.
18. Lin HL, Wu DC, Cheng SM, Chen CJ, Wang MC, Cheng CA. Association between Electronic Medical Records and Healthcare Quality. *Medicine (United States)* 2020;99. <https://doi.org/10.1097/MD.00000000000021182>.
19. De Benedictis A, Lettieri E, Gastaldi L, Masella C, Urgu A, Tartaglioni D. Electronic Medical Records implementation in hospital: An empirical investigation of individual and organizational determinants. *PLoS One* 2020;15:e0234108. <https://doi.org/10.1371/JOURNAL.PONE.0234108>.
20. Müller-Staub M, Needham I, Odenbreit M, Lavin MA, van Achterberg T. Improved Quality of Nursing Documentation: Results of a Nursing Diagnoses, Interventions, and Outcomes Implementation Study. *International Journal of Nursing Terminologies and Classifications* 2007;18:5–17. <https://doi.org/10.1111/J.1744-618X.2007.00043.X>.
21. Kelley TF, Brandon DH, Docherty SL. Electronic Nursing Documentation as a Strategy to Improve Quality of Patient Care. *Journal of Nursing Scholarship* 2011;43:154–62. <https://doi.org/10.1111/J.1547-5069.2011.01397.X>.
22. Salameh B, Eddy LL, Batran A, Hijaz A, Jaser S. Nurses' Attitudes Toward the Use of an Electronic Health Information System in a Developing Country. <https://doi.org/10.1177/2377960819843711> 2019;5. <https://doi.org/10.1177/2377960819843711>.
23. Phillips T, Baur K. Nursing Praxis for Reducing Documentation Burden Within Nursing Admission Assessments. *CIN - Computers Informatics Nursing* 2021;39:627–33. <https://doi.org/10.1097/CIN.0000000000000776>.

24. Hanifah D, Utami TN, Nuraini N. Analisis Standar Pelayanan Rekam Medis di Rumah Sakit Umum Daerah Kotapinang. *Jurnal Kebidanan, Keperawatan Dan Kesehatan (BIKES)* 2022;2:24–9. <https://doi.org/10.51849/J-BIKES.V2I2.33>.
25. Damayanti. S.P. tinjauan pengetahuan dan sikap dokter dalam pengisian kelengkapan resume medis rawat inap di rsud kota madiun tahun 2020. *Jurnal STIKES Bhakti Husada Mulia Madiun* 2021.
26. Mahbubah ZS, Ningsih KP, Wuryanto S, Yani A, Brawijaya YJ, Barat R. Analisis Kelengkapan Rekam Medis Di Rumah Sakit: Literature Review Analysis of Medical Record Completeness in Hospital: Literature Review. *Indonesian Journal of Health Information Management (IJHIM)* 2021;1.
27. Asmirajanti M, Hamid AYS, Hariyati RTS. Nursing care activities based on documentation. *BMC Nurs* 2019;18:1–5. <https://doi.org/10.1186/S12912-019-0352-0/TABLES/1>.
28. Gaudet CA. Electronic documentation and nurse-patient interaction. *Advances in Nursing Science* 2016;39:3–14. <https://doi.org/10.1097/ANS.000000000000098>.
29. Latipah T, Solihah S, Setiatin S. Pengaruh Rekam Medis Elektronik Terhadap Peningkatan Efektivitas Pelayanan Rawat Jalan di Rumah Sakit X. *Cerdika: Jurnal Ilmiah Indonesia* 2021;1:1422–34. <https://doi.org/10.36418/cerdika.v1i10.215>.
30. Hanifah F.F. hubungan motivasi perawat dengan pendokumentasian asuhan keperawatan elektronik: literatur review. *Jurnal Universitas Aisyiyah Yogyakarta* 2022.
31. Liu H, Ling D-L, Su I. Comment of Walker and Avant’s method of concept analysis. *Article TMR Integrative Nursing* 2018;2:1–3. <https://doi.org/10.12032/TMRIN20180307>.
32. Jedwab RM, Redley B, Manias E, Dobroff N, Hutchinson AM. How does implementation of an electronic medical record system impact nurses’ work motivation, engagement, satisfaction and well-being? A realist review protocol. *BMJ Open* 2021;11:e055847. <https://doi.org/10.1136/BMJOPEN-2021-055847>.
33. Paans W, Sermeus W, Nieweg RMB, Van Der Schans CP. Prevalence of accurate nursing documentation in patient records. *J Adv Nurs* 2010;66:2481–9. <https://doi.org/10.1111/J.1365-2648.2010.05433.X>.
34. Saumalina, Marlina, Usman S. The Related Factors to Nursing Documentation at General Hospital Dr. Zainoel Abidin Banda Aceh. *International Journal of Nursing Education* 2023;15:89–94. <https://doi.org/10.37506/IJONE.V15I1.18998>.
35. Suryani Orangbio T, Wagey FW, Vanda Doda DD, Sam Ratulangi U, Pascasarjana Manado P. Faktor-faktor yang memengaruhi analisis kelengkapan pengisian rekam medis elektronik instalasi rawat jalan rsup prof dr. R.d kandou manado. *Jurnal Universitas Sam Ratulangi* 2023;4.
36. Gunawan TS, Christianto GM. Rekam Medis/Kesehatan Elektronik (RMKE): Integrasi Sistem Kesehatan. *Jurnal Etika Kedokteran Indonesia* 2020;4:27. <https://doi.org/10.26880/jeki.v4i1.43>.



37. Farid ZM, Fernando NR, Sonia D. Efektivitas Penggunaan Rekam Medis Elektronik Terhadap Pelayanan Pasien Rawat Jalan di Klinik Darul Arqam Garut. *Cerdika: Jurnal Ilmiah Indonesia* 2021;1:1247–54. <https://doi.org/10.36418/cerdika.v1i9.178>.
38. Puspitaningrum.I. SupriatunE, & PutriDS. Dokumentasi Keperawatan Berbasis Elektronik Meningkatkan Keselamatan Pasien dan Mutu Asuhan Keperawatan. *Jurnal Ilmu Kesehatan* 2023;1:255–67.
39. Vionita Bawuno V, Ayu Erika K, Syam Fakultas Keperawatan Y, Hasanuddin Makassar U, Perintis Kemerdekaan NoKM J, Indah T, et al. Dampak penggunaan dokumentasi keperawatan elektronik terhadap keselamatan pasien: a literature review. 2023.
40. Susanto D, Magister Keperawatan P, Ilmu Kesehatan F, Brawijaya U, Dieng Exclusive P, Malang K, et al. Efektivitas instrument d-cacth sebagai alat ukur dokumentasi keperawatan: scoping review. 2023.

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