

How electronic medical records improve the Quality of patient care

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Resumen

Durante el proceso de investigación realizado en el siguiente artículo se tomaron en cuenta cuatro puntos importantes de los expedientes clínicos electrónicos: como mejoran los tiempos de atención, el manejo y calidad de la información, accesibilidad a la información y seguimiento seguro de los procesos administrativos y médicos. Se hizo una comparación de distintos artículos para identificar que necesidades cubre este sistema, como interviene en los procesos hospitalarios de los pacientes, además se realizó una comparación del manejo de dichos procesos cuando no hay de por medio un sistema de información, notando cuales son las ventajas de su implementación, además de beneficiar principalmente al paciente de manera directa, mejorando el cuidado de la salud y llevando a cabo cada proceso correctamente.

Abstract

During the research process carried out in the following article, four essential points of electronic clinical records considered: how they improve response times, the handling and quality of information, accessibility to information, and secure tracking of administrative and medical processes. Furthermore, we compared different articles to identify the needs that this system covers and how it intervenes in hospital processes for patients. Finally, a comparison was also made of the management of these processes when no information system is involved, noting the advantages of its implementation, primarily benefiting the patient directly, improving healthcare, and correctly carrying out each process.

Palabras Clave: Expedientes clínicos electrónicos, procesos hospitalarios, sistemas de información, calidad de información

Keywords: Electronic records, hospital processes, information systems, information quality

1. INTRODUCTION

Electronic medical records (EMRs) are a technological tool that is increasingly being used in the field of healthcare. EMRs are digital records of a patient's medical information, including their medical history, test results, diagnoses, prescribed medications, and physician's notes.

EMRs bring numerous advantages, such as improving the efficiency and quality of healthcare, reducing errors and duplications, and enabling quick and secure information sharing among healthcare professionals.

EMRs encompass a set of optimized processes through an information system that covers all hospital areas, specifically medical care, and social work areas, thereby enhancing and improving patient care management [1].

2. METHODOLOGY

Different articles from certified journals, Google Scholar, and the Journal of Medical Internet Research were compared. The research was conducted more quickly using "EHR improving the quality of care" or "Electronic

Medical Records" as keywords. After finding the EHR or EMR articles with specific topics related to improving response times and quality of care, they were analyzed to evaluate whether the authors described the benefits of implementing Electronic Medical Records and the accessibility of patient information used by healthcare professionals in detail. Additionally, articles with metrics determining the advantages of EMRs were sought. The research yielded both quantitative and qualitative results, which determined that the research topics were better understood.

3. ELECTRONIC MEDICAL RECORDS

The accelerated and substantial use of Information and Communication Technologies (ICT) in the government sector was driven, on one hand, by the need to streamline, modernize, transparentize, optimize, and make processes more efficient, and on the other hand, by the growing demand from society for quality public services. This led to the consolidation of guidelines for the transformation from a bureaucratic government to an Electronic Government [2]. Within different institutions, there is the area of e-Health, a field that has gained great importance in the academic and governmental realms. One aspect of e-Health is the Electronic Medical Record (EMR) or Electronic Health Record (EHR), which serves as a means of communication between healthcare professionals and patients. Therefore, it has been the subject of numerous publications with various approaches and variable results [3].

An Electronic Medical Record (EMR) is the electronic collection of information regarding the health status of an individual patient or population. Currently, an EMR gathers relevant information from different areas of the patient, including clinical, administrative, demographic, medical history, allergies, medication, test results, and account details [4].

The EMR is designed to accurately inform and provide real-time updates on the patient's status, allowing it to be accessed and updated by different medical personnel who require access. This helps keep the record up to date from various points of view regarding patient care. The EMR is conceived as an interoperable tool that can integrate medical information from other systems, such as interpreted results of clinical images, laboratory studies, or real-time information on the patient's vital signs.

An EMR is organized through modules that enable different functionalities for clinical operations, control, and record-keeping for the patient. In Mexico, the NOM024-SSA3-2012 "Electronic Health Record Information Systems" is used, which establishes its main functionalities [5].

3.1 Benefits of using electronic medical records

With the emergence of electronic medical records, healthcare professionals have improved the doctor-patient relationship. This technology-based tool offers many advantages in terms of reducing the time spent on recording information compared to traditional paper-based methods, particularly in terms of service efficiency, decreased response time, and process improvement in healthcare services [6].

Healthcare experts, policymakers, payers, and consumers consider medical information technologies, such as electronic medical records and computerized provider order entry, to be essential in transforming the healthcare industry [7]. In this research, we will focus on the benefits for patients.

Electronic health records (EHRs) or electronic medical records (EMRs) make healthcare more efficient. They enhance the quality of care by making patients' medical histories more accessible.

The benefits associated with an EMR have been widely discussed in different countries and studies, and the advantages of implementing an EMR extend to all areas of a hospital related to patient care, encompassing a wide range of situations [8].

4. PACIENTE PATIENT CARE QUALITY

4.1 How it improves patient care quality

The most controversial aspect so far is the improvement of patient care quality since quality in the context of healthcare is understood as the recovery of health with the least possible risk of complications, the best cost-benefit ratio, and the highest patient satisfaction [9]. It is very challenging to evaluate this and subsequently link the study's results to the proper use of an EMR that has the necessary modules to facilitate the development of medical practice related to the study.

In this same topic, efforts have been made to measure quality based on specific treatments, where quality measurement indicators have been defined using electronic medical records. However, the information from the EMR was not entirely reliable, yet the result was consistent with the current situation in the country, which lacks sufficient technology applied to the healthcare field [10].

4.2 How they improve response times

Electronic health records (EHRs) make healthcare more efficient. They improve the quality of care by making patients' medical histories more accessible. However, little is known about the factors that contribute to the successful implementation of EHR in clinics and hospitals [3].

However, their successful implementation depends on a combination of both technical and socio-organizational factors [4]. In particular, the adoption and confident use of EHR systems by physicians is crucial for the overall success of EHR implementation, while rushed implementation combined with a lack of support and user resistance can result in implementation failure [5].

The International Organization for Standardization defines the main objective of an EHR system as providing a patient-centered health information record that supports care within a medical environment. The implementation of EHR systems and other health information technology initiatives to support healthcare delivery has become common in national healthcare systems worldwide [7].

The widespread adoption of EHR systems is supported by reports of their positive impact on the quality and cost of healthcare delivery. Specifically, EHR systems are reported to contribute to reducing problems such as lost records, duplication of efforts, wrong identity, medication administration errors, idiosyncratic clinical decisions, and inefficient billing [8]. In terms of improving response times, the initial implementation of an EHR, like any system, involves a learning curve that may cause an increase in time and effort, primarily for clinical staff.

5. HOW INFORMATION ACCESSIBILITY IMPROVES

5.1 Reduction of study delivery times

Given the premise of interoperability, the EHR integrates with other systems involved in patient care, such as vital signs monitors, imaging studies, and laboratory tests. Through integration via the EHR, the request and

delivery of results are done within the system, allowing study results to reach the corresponding clinical staff immediately. In the case of imaging, it can be determined whether the images should be available for consultation as soon as they are taken or until they are interpreted by a technician. It is worth noting that this process eliminates the need for printing images as the entire cycle is managed digitally.

5.2 Reduction of costs by eliminating complexity and duplications

Like any system implementation, the adoption of an EHR requires rethinking the way some of the most important processes in hospital work, both clinical and administrative. This represents a valuable opportunity to simplify processes using the EHR. In addition to process simplification, an EHR that integrates patient safety features such as references to care protocols, contraindication alerts, and medication reactions can lead to cost reduction in patient care.

This benefit is highly anticipated and challenging to achieve, as it requires a total cost of ownership study for each system, considering that not all hospitals have the infrastructure and specialized personnel to maintain an EHR. Eastaugh comments that in the United States, productivity improvements are typically expected to be seen after 2 years of implementation, and cost savings are expected to reach the return-on-investment point between 5 and 7 years after implementation [10].

5.3 Advantages of EHRs

In Mexico, as we can see in the module definition according to the SSA, efforts are made to achieve several expected benefits of an EHR. In a quick analysis, we can associate the chapters with the expected benefits for each one:

- Medical care: improved quality, better control of resources, reduced time.
- Technological infrastructure: availability of records through interoperability, reduced time in delivering studies.
- Decision support: improved time and quality of hospital statistics, and process improvement.

In addition to the reported benefits of information integration and process improvement, there are studies linking the quality of care to proper adherence to defined processes and the quality of document completion in the hospital. This is where the definition of an EHR as a comprehensive tool for process control and quality becomes significant. In a study conducted in 18 hospitals in Guadalajara, it was found that the lack of process standardization and the presence of a deficient information system were identified as inhibitors of quality in 22% of cases, while poor completion of medical records was observed in 33% of cases [12].

6. RELEVANT RESEARCH IN THE FIELD OF STUDY

6.1 Systematic review: impact of health information technology on quality, efficiency, and costs of medical care

The author Chaudhry, B. et al. conducted a systematic review on how technology benefits medical services and improves the quality of information, operational costs, and patient care. This research aims to understand how electronic records enhance the quality of patient care and reduce hospital operational costs. It also discusses the benefits of health information systems in terms of accessibility to patient information, enabling physicians to make better diagnoses and aiding decision-making, as well as facilitating a smoother flow of care in

administrative areas for all patients. It was quantitatively demonstrated that electronic clinical records improved the quality of information by 86%, benefiting patients in improving the care they receive [3].

6.2 Value of the electronic medical record for hospital care: update from the literature

Author Jürgen Stausberg explored the advantages of Electronic Medical Records (EMR) and the benefits they offer to patients and healthcare professionals in the medical field. This research focuses on evaluating the value of the hospital medical record for patient benefit. It emphasizes how information technology can streamline patient care processes. The author highlights the scarcity of information available regarding electronic medical records and delves deeper into the advantages of implementing Health Information Systems (HIS). The use of EMRs in various hospitals has yielded significant benefits. Through quantitative research, it was found that access to accurate information improved the quality of patient care by 72% in six hospitals [11].

6.3 Importance of using information systems in the automation of clinical records: a systematic review

Author Preciado Rodríguez delved into the disadvantages of not having an information system for clinical records, but little is known about the advantages it brings to medical institutions. The focus is on highlighting the contributions of an Information System (IS). Information systems in healthcare have contributed to the automation of clinical records and play a crucial role in medical care. The study identified that information systems improve physician-patient communication, expedite healthcare processes, and reduce costs and time. Robust solutions that automate the registration of clinical records and incorporate cloud computing, service-oriented architecture, and healthcare software as a service was found. These solutions reduce registration errors and paper accumulation in the filing area while improving data quality and resulting information for decision-making in healthcare management [13].

6.4 Perception of the usefulness of electronic medical records in a national health institute

Author Marvin Jaime Merino Casas investigated the delays caused by the lack of an information system and the significant physical space occupied by large amounts of paper files. Information systems help accelerate processes by facilitating patient data capture and preventing errors and information loss. They also contribute to the accreditation and certification of healthcare facilities, enhance the quality of medical care, and save time and effort. The study aimed to develop methods and strategies to streamline processes and optimize time savings through online appointments and electronic medical record systems that improve patient care. Based on surveys, it was concluded that information systems generate 97% reliability in patient information during the hospital process, enabling physicians to make better decisions regarding patient health [14].

6.5 Experiences in the implementation of electronic medical records

Author Rosalía Rivera Rodríguez discusses the importance of e-health, with the Electronic Medical Record (EMR) playing a significant role in achieving better outcomes in medical practice. There have been few studies analyzing and identifying the current status of EMR implementation worldwide. This research aims to analyze the current landscape of EMR implementation in various countries, considering the advantages, disadvantages, challenges, and success factors. Fifteen articles directly related to the investigated topic were identified. The objective was to examine the implementation panorama of EMRs in different countries, considering the aspects of advantages, disadvantages, challenges, and success factors as presented in the literature. It was also found that, in numerical terms, there are more challenges in EMR implementation than

the advantages proposed by its use. One of the most significant challenges identified is interoperability, specifically semantic interoperability [15].

7. RESULTS

Out of 30 articles related to EMRs, 15 focused more on the quality and accessibility of information, considering that most physicians need clear patient data and requirements to provide quality care. Additionally, 91% of healthcare professionals were able to provide better patient care when their medical history was accessible. Ten articles emphasized accessibility and quality but focused on the impact of reducing patient waiting times. The implementation of EMRs enabled 50% faster data capture, avoiding long waiting queues as explained by the authors. EMRs also reduced consultation time due to easy access to patient information, as mentioned earlier. The remaining five articles focused more on the cost reduction generated by the implementation of information systems. This is due to the elimination of stationery supplies used to create paper-based records. According to the studies conducted in these articles, a 56% cost reduction was achieved.

8. DISCUSSION AND CONCLUSIONS

Electronic medical records have the potential to significantly improve the quality of patient care. By enhancing patient safety, care coordination, and quality of care, EMRs can help healthcare providers deliver more effective and efficient care. Moreover, with the increasing amount of medical information available, it is more important than ever to have tools that enable healthcare providers to access this information quickly and accurately. Ultimately, the implementation of EMRs can improve patients' quality of life and reduce the burden on the healthcare system as a whole.

In general, electronic medical records improve the quality of patient care by providing quick access to information, facilitating care coordination, enhancing the accuracy and safety of medical records, and providing support for clinical decision-making. These benefits contribute to more effective, secure, and personalized care, which in turn has a positive impact on patients' health.

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