

**Shifting towards the use of electronic health records to improve the quality of health care services.
-Australian experience-**

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Abstract :

This study aims to know the importance of using electronic health records and their role in improving the quality of health care services; And To answer this question and the problem posed, the descriptive approach was used, which allowed us to collect information and data and analyze them according to the requirements of the study.

Through the Australian experience; And by using electronic business in health institutions and through electronic health records, the study reached a number of results, the most important of which is that the use of electronic health records contributes to improving health care services by facilitating the movement of patients between health care service providers, reducing redundancy, and reducing the time required for registration .

Keywords: electronic health records, health care services, quality of health services.

JEL Classification Codes: I1,I18,O30

المخلص:

تهدف هذه الدراسة إلى معرفة أهمية استخدام السجلات الصحية الإلكترونية ودورها في تحسين جودة خدمات الرعاية الصحية، وللإجابة عن هذا التساؤل والاشكال المطروح تم استخدام المنهج الوصفي الذي سمح لنا بتجميع المعلومات والبيانات وتحليلها حسب متطلبات الدراسة.

فمن خلال التجربة الأسترالية وبفضل الأعمال الإلكترونية في المؤسسات الصحية ومن خلال السجلات الصحية الإلكترونية، توصلت الدراسة إلى جملة من النتائج أهمها أن استخدام السجلات الصحية الإلكترونية يساهم في تحسين خدمات الرعاية الصحية من خلال تسهيل حركة المرضى بين مقدمي خدمات الرعاية الصحية، والحد من التكرار، وتقليل الوقت المطلوب للتسجيل.

الكلمات المفتاحية: السجلات الصحية الإلكترونية- خدمات الرعاية الصحية- جودة الخدمات الصحية

ترميز JEL: I1,I18,O30

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1. Introduction:

In light of the great integration between medicine and technology, it has benefited both the beneficiary of the service, who is the patient, and the provider, who is the doctor alike; The patient is now getting health care services in less time and with high quality, with the possibility of approaching and comparing results and treatments. As for the doctor, he is now able to view the patient's file and medical history and review this data at any time, with the ability to compare it with other patients; All this through approved systems, programs and applications in hospitals and medical centers. Many countries of the world have achieved great success in their health institutions at the level of applying electronic record systems and programs after realizing their importance in developing the health care provided, as it is no less important than any other medical or therapeutic achievement. Electronic health records serve as the primary source of information that both the patient relies on to obtain various information about the types of health services provided, as well as the doctor in making various medical decisions.

Information technology in the health sector has provided huge potential through advanced software and applications for electronic medical records. The emergence of modern software, systems and applications for health services and their widespread spread facilitated the work of doctors and nursing teams in hospitals and medical centers, and also contributed to the process of marketing health services electronically by providing better and more comprehensive care to the patient.

In the light of this previous proposition, the features of our research problem are clear, which can be formulated as follows:

How can electronic health records contribute to improving the quality of healthcare services?

To answer these questions, we divided the research into the following axes:

- First - a theoretical introduction about electronic health records, health care services and health service quality;
- Second - the importance of electronic health records and their role in improving the quality of health services;
- Third - Presentation of the Australian experience.

The importance of studying:

The importance of this study lies in shedding light on digitization and its applications in the health field, through the use of electronic record systems and programs, which is a new and innovative method that requires attention, given its great importance in improving health services significantly and clearly.

Objectives of the study:

- The desire of researchers to study a topic that keeps pace with the prevailing conditions;
- shed light on concepts related to digital health for health services;
- Highlighting the importance of electronic health records to improve the quality of care services;
- Clarifying the benefits that can accrue to the health sector when it is digitized through the use of electronic health records in its various health institutions, especially in light of crises;
- Presentation of Australia's experience towards digital transformation in its health sector, through the application of the unified electronic health file, and an attempt to benefit from it, especially during the period of the Corona pandemic and after Corona.

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Study methodology:

Due to the nature of the subject, and to be familiar with all its aspects, we had to adopt the methods used in economic research and studies, including the descriptive and analytical approach, which allows us to collect information and data and analyze them according to the requirements of the study.

2 . a theoretical introduction about electronic health records, health care services and health service quality:

2.1.The concept of electronic health records:

2.1.1 Define the electronic health record:

Before addressing the concept of the electronic health record, we must refer to the definition of electronic health, as defined by the World Health Organization as: the unified use of electronic information and communication technology in the health sector (<https://www.moh.gov.sa/Ministry/nehs/Pages/Ehealth.aspx>, 2022).

E-Health is a general concept that includes the use and application of all types of information technology (software, networks, communications, etc..) in the health services sector and its branches, and benefiting from these technologies in everything that promotes health, helps prevent diseases, and supports medical and clinical research. (<https://www.ehealthsa.com/archives/1499>, 2022)

An electronic health record (EHR) defined by the American Association for Healthcare Information and Management Systems as a medical record in digital format; the electronic record contains all personal and administrative information of the patient, diagnostic information, medical history, vital signs, therapeutic procedures taken and consents to these procedures, laboratory data and radios. (<https://www.himss.org>), 2022)

The American Federation of Health Information Management defined it as an information repository that includes all patient information, based on a computer with all its advanced capabilities of storing information, processing and transferring data through information networks and modern means of communication. (<https://www.ahima.org>, 2022)

2.1.2 Components of the electronic health record:

The medical record for each patient contains medical and nursing information that covers aspects related to the medical condition that he suffers from, and usually includes:

- Chronic diseases or health problems from which the patient suffers;
- drugs and medications he is taking or any other type of treatment;
- the presence of an allergy to a particular drug;
- Previous surgeries, with their dates, doctor's name, and a report including a diagnosis of the condition that required the surgery;
- Results of laboratory tests and diagnostic images taken by the patient;
- family medical history in the event of chronic diseases or cancerous conditions, etc.;
- Vaccines and their dates;
- Previous visits to the patient, what was the diagnosis, the date and reason for each visit.

2.1.3 Characteristics of the electronic health record:

A good electronic health record should support:

- security and privacy of information;
- Ensure that information is shared among all members of the medical team to ensure efficient medical care is provided;
- Overcoming problems and reducing existing errors in the paper medical record;
- Good integrated documentation from the patient's admission until leaving the hospital; In addition to that, documenting the signature and name of the person recording the data and the date thereof;
- Ease of use and taking into account that the people working on the system are not computer professionals, and their skills are uneven;
- Adopting standards issued by accredited bodies to reduce errors and increase data integrity.

3. the importance of the electronic health record and its role in improving the quality of health services:

3.1. The importance of electronic health records:

The importance of electronic health records lies in (https://www.theArabHospital.com, 2022)

- Quick access to patient information with private notes about the condition and the ability to share it with other doctors, healthcare providers, insurance companies, pharmacies and diagnostic centers, so that that information becomes faster and more traceable;
- Doctors can reach an accurate diagnosis more quickly by easily looking at patients' test results and checking past results or any medical practices the patient has done in the past;
- The use of electronic records allows healthcare providers to simultaneously access a patient's record from any computer;
- Providing up-to-date information on a patient's complete medical history, including current test results and recommendations of other physicians, allowing for more effective collaboration in multiple aspects of a patient's care. Clinical practitioners can quickly transfer patient data to other departments or service providers, with fewer errors leading to better results management;
- Health records ensure that the patient gets a better diagnosis with a very low error rate, as the patient gets advice and preventive measures that contribute to improving the management of his disease. This flexibility in accessing the patient's complete records means that there is no need to fill in the same papers and data at each visit to the doctor, because the results and images are all in one place, and the result is improved management of medical conditions, especially chronic conditions, better care and more accurate diagnosis.

3.2 The role of electronic health records in improving the quality of health services:

Electronic health records have a prominent role in improving the quality of health services through:

-Less paperwork and more storage:

Benefiting from electronic health records is not limited to only the doctor and the patient, but the hospital administration is one of the beneficiaries most due to the time, effort and costs required by administrative tasks, as the staff used to spend a long time filling out the paper forms for each patient. However, paperless electronic records eliminated all of this, which contributed to the simplification of routine tasks, and with the decrease in the amount of papers and the recovery of

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large areas that were designated for storing archives; With instant storage and retrieval of digital files, healthcare providers' offices are less crowded.

-Raising the level of quality:

Electronic health records provide the ability to exchange complete information about the patient in a short time, which is accurate, up-to-date and comprehensive information, which leads to a higher level of quality of care that the patient receives, starting from diagnosis and ending with reduced errors; By sending automatic reminders for visits and preventive procedures, patient records can help patients better manage their conditions and participate more in their healthcare. E-prescriptions also allow physicians to communicate directly with the pharmacy, reducing errors and saving time by eliminating lost prescriptions; Patient safety has been improved, as electronic prescribers automatically check for potential drug interactions.

-Raising efficiency and productivity:

Electronic health records are more efficient than paper records, as they allow quick access to the patient's file and information needed by health care providers in a short time and from anywhere. In addition to the possibility of inquiring about a specific case with other doctors, pharmacies, and diagnostic centers, which is a faster and more traceable method; It also reduces missed messages and follow-up calls. The simplification of managing electronic files and records, the existence of an integrated scheduling between the various stakeholders, and automatic coding are all features that increase efficiency and increase productivity.

The electronic health record has many benefits that are reflected in the quality of health services and thus the performance of the health institution, through:

- Improving medical care: as it represents an integrated source of data necessary to follow up on the patient's condition and treatment. The American Society for Medical Information Management indicated that the electronic health record plays unique roles;
- The quality of the health institution's administrative performance, especially in institutions with multiple branches, and the reduction of financial expenditures for material and human matters;
- serves as a legal document describing the medical care provided to the patient;
- a source of clinical data used in research;
- Serves as a great and very important resource in medical education;
- It provides an effective way of communication and planning between members of the medical team to serve and care for the patient.

4. The concept of health care services:

4.1. Definition of health care services:

The concept of health service in general is derived mainly from the general concept of services and can be defined as follows:

Health services are “aimed at participating in health improvement, diagnosis, treatment and rehabilitation of people at risk” (<http://www.who.int/bulletin/volumes/91/5/12-211.112664> /ar/, 2022)

The concept of product in the hospital industry refers to what the health institution provides of tangible products such as medicine and food, or services such as radio images and laboratory tests,

or non-material services such as clinical examination, surgical operations, education, health and nutritional awareness, nursing services, and other (Nuseairat, 2014, p. 136).

The health service is “all services provided by health institutions, whether it is curative directed at the individual, or preventive directed at society and the environment, or productive such as medicines, medical preparations, medical devices, etc., to raise the health level of individuals and meet the desires associated with this service” (Abdelkader, 2012, p. 216)

4.2. Characteristics of health care services:

The characteristics of health services are not much different from the characteristics of services in general. Bennett defined it as follows (Youssef, 2008, p. 100) :

Health services are intangible products;

- not separable;
- asymmetry;
- the disappearance of the health service;
- Non-transfer of ownership.

The aforementioned characteristics are general characteristics of health care services and are common to almost all services, as there are characteristics of a special nature to health care services, namely:

- Health services are often not guaranteed.
- Judging their quality is a difficult and complex issue;
- It requires great cooperation between the service provider and the beneficiary.
- It is subject to the consumer's satisfaction with its quality, as he will perceive it.

5. The concept of health service quality:

5.1. Definition of Health Service Quality:

The World Health Organization defines quality as “the effort that allows ensuring consistency of diagnosis and treatment processes for each patient, with the aim of achieving the best health results in line with modern medical science at the lowest cost and with the lowest risks, and good relations that win patient satisfaction within the health institution” (Bruno, 1999, p. 10)

As for the quality of health care services, the Joint Commission for Accreditation of Health Organizations defines it as: “the degree of adherence to agreed standards to help determine a good level of practice, and to know the expected results of a service, procedure, or diagnosis of a particular medical problem” (Mukhaimer & Mohamed, 2008, p. 187)

5.2. The importance of the quality of health services:

The quality of health services is of great importance, which appears in many aspects, and we can refer to some of them as follows . (Aburof, 2016, pp. 138-139):

- It helps the health institution and enables it to identify the needs of the beneficiaries, and their desires and aspirations in the health services provided, and strive to satisfy and achieve those needs and desires, which is positively reflected in improving the reputation of the health institution, and thus the demand for it and reliance on its services;

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- The ability to find an optimal way to address problems and reduce their effects before they escalate, by focusing on problems that have a direct impact on the level of services and limit their effectiveness.
- The quality of health services is an important factor in measuring the level of satisfaction achieved by beneficiaries.
- It helps in the continuous improvement of all components of the health system;
- Quality programs help workers in health institutions of all levels, develop them and encourage them to innovate and perform their work properly, increase their productivity and urge them to present their best talents, capabilities and capabilities.
- It reduces medical errors and losses, whether material or moral.
- Commitment to the quality of health services and continuous improvement leads to a reduction in the residence of beneficiaries and a reduction in costs.

5.3. Dimensions of quality for health services

Through the following table, we note the most important dimensions of quality of health services.

Table 01 . Dimensions of quality of health services

The dimension	Submission criteria	Examples
Reliability	<ul style="list-style-type: none"> • Accuracy of approved records in the hospital administration. • The validity of the financial statements. 	<ul style="list-style-type: none"> • High confidence of the patient that his financial accounts are correct upon leaving the hospital. • The patient has confidence that his life is in safe hands.
Response	<ul style="list-style-type: none"> • Provide immediate treatment services. • In response to external emergency calls. • Work throughout the hours of the day. 	<ul style="list-style-type: none"> • The arrival of ambulances within a few minutes. • The operating room is fully prepared for all cases.
Protection	<ul style="list-style-type: none"> The high reputation and stature of the hospital. • Outstanding knowledge and skill of doctors and medical team. • Personal qualities of employees. 	<ul style="list-style-type: none"> • good treatment by doctors. • Training and high skill in performance.

Tangibility	<ul style="list-style-type: none"> • Tools used in diagnosis and treatment. • The external appearance of the service providers. • Suitable waiting and reception places. 	<ul style="list-style-type: none"> • The cleanliness of the doctor's clinic, being of a specialized appearance. • Quality of food provided to hospitalized patients.
Empathy	<ul style="list-style-type: none"> • Personal attention to the patient. • Complete listening to the patient's complaint. • Meet the customer's needs in a spirit of friendliness and kindness. 	<ul style="list-style-type: none"> • The nurse is like a compassionate mother for the patient. • Considering that the patient is always right.

Source: Thamer Yasser Elbekri, Hospital Administration: Elyazuri Scientific Publishing and Distribution House, Amman, Jordan, 2012, p. 213.

6. Presentation of the Australian experience:

Most global health systems seek to design and implement a unified electronic health record for their citizens that includes all health and personal information and the patient's medical history, through which access can be made and facilitate access to health services, achieving the principle of more patient integration in the health process, reducing the cost of services and raising the level of service; Among the most prominent of these experiences, we find the experience of the health system in Australia, which we will highlight as a successful experience to benefit from in the application of the unified electronic health file.

6.1. Australian health system:

The Australian health system is considered one of the most efficient and effective health systems in the world. In recent years, it has been ranked many times among the top ten health systems internationally, and the Australian health system ranked seventh among 48 health systems in the world in terms of efficiency, according to (Bloomberg) in 2014; It also ranked tenth, according to the Numbeo Health Care Index report for the year 2019, after Taiwan, South Korea, Japan, Austria, Denmark, Thailand, Spain, France, Belgium, and this result is consistent with the high indicators achieved by the system based on reports of the organization global health.

Table 02. Structures and human resources in the Australian health system.

	2017		2022
population	23.5 million people		25.7 million people
% using the Internet	% 88.8		91% (89% in 2021)
Nbr of hospitals	1353 hospitals	Total Public hospitals 696	-
		Total Private hospitals 657	
Nbr of doctors	26,000 doctors		100000

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Nbr of pharmacies	5250 pharmacy	5935
Health insurance	Medicare Government program in addition to other types of non-governmental	

Source : - <https://www.ehealthsa.com/archives/2787>
 - <https://www.Statista.com>
 - <https://www.health.gov.au>

Through the table, we notice an increase in the population of Australia by approximately two million between 2017 and 2022, and there is also an increase in the use of the Internet by an estimated 2.2%, due to the shift towards digitization and electronic transactions, especially in the health sector, and there is also an increase in each of the medical staff represented by doctors as well as health structures; In Australia, nurses and midwives constitute the largest workforce in the Australian health sector, as the number of registered persons until the first semester of the year 2022 AD reached 450,000.

Health services in Australia are provided through a network of public and private health institutions based on the so-called BIOMEDICAL model of health. According to this model, the focus is on the role that biomedical sciences play in the fields of diagnosis and treatment of diseases. The healthcare system run and funded by the Australian Government is called Medicare and has been Australia's universal healthcare scheme since 1984, providing free healthcare to permanent residents and Australian citizens in government hospitals. There is also a private health insurance scheme that provides health insurance coverage for visitors and employees contracting with Australian employers, as well as diplomats temporarily residing in Australia, which is known as Overseas Visitor Health Cover (OVHC). The Overseas Student Health Insurance Scheme (OSHC) also provides insurance coverage for international students studying at Australian universities through a wide range of private health insurance companies (<https://ar.sacm.org.au/about-australia/>, 2022)

Table 03: Medical and paramedical staff and hospitals in Australia during the years 2016-2019

Australia	Other	Previous	Previous	Previous
nurses	13.41	13.20	per 1000 people	Dec 2019
Doctors	4.01	3.94	per 1000 people	Dec 2019
Hospitals	53.60	53.94	per 1000 people	Dec 2018
Hospital beds	3.84	3.82	per 1000 people	Dec 2016

source : <https://ar.tradingeconomics.com/australia/medical-doctors>

6.2. Using the Unified Electronic Health File in Australia:

The Australian experience is fairly recent, as it was launched in late 2012; The structure of the system consists of a central database and an electronic platform called (MyHR) (My Health Record), which is directly linked with data centers in hospitals, the primary health care sector, pharmacies, and government databases. These centers allow the system to access comprehensive summary records.

The data available in the unified electronic health file includes the person's medical history, medications dispensed to him, laboratory test results, and personal information. Also, the person (or whoever has authority such as parents or children) can create private personal notes in the system, update them, and share them with the family doctor or the treating medical team as needed. For example, a person can record medicines that he took without a prescription or nutritional supplements, or symptoms that he was exposed to in a place or as a result of taking a specific medicine. Also, a person can specify health goals that he seeks or a diet program to follow.

Through the platform, the user can view his/her medical record and sick history, information about the medications used, request renewal of the prescription, review the results of laboratory analyzes, radio reports, and give permission to the health practitioner to view the patient's profile, and requests for medication compensation through the government insurance program.

The patient database in MyHR is also linked with many government health databases such as the government insurance program Medicare, the government drug subsidy program Pharmaceutical Benefits Services, the organ donation program, and also the database of vaccinations and vaccinations; The platform allows the health practitioner (doctor, pharmacist, specialist) and health institutions to register to view their patients' information after the patient's approval and according to the powers granted to them.

Table 04. Registrants and health service providers linked to the electronic health record system.

My Health Record Statistics

as at 26 November 2017



source : <https://www.ehealthsa.com/archives/2787>

Through the table, we notice that there are more than 5 million electronic medical files created, which is equivalent to 20% of the population in Australia, and women represent the largest segment

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of the registrants at 54% of the registrants, while males are 46%; The number of health service providers linked to the system has reached more than 10,000 health service providers, including (family doctors, hospitals, pharmacies, health care providers for the elderly, specialists, and others), who have uploaded more than 3.5 million health documents that have been uploaded to the system and more than of 14 million prescriptions.

6.3. Results and advantages of applying electronic health records:

Many First World countries have had a great deal of success in launching such initiatives; In the United States, as in Australia and the United Kingdom, the initial electronic health record model is evolving at the national level. To this day, IOM and the National Committee on Vital and Health Statistics have focused primarily on the technical aspects of implementing electronic health records in the United States. Both identified two key elements of the project: the first is to build a national health information infrastructure, and the second is to enable interoperability and comparability of patient safety data. In order to achieve data interoperability and comparability, the National Committee for Vital and Health Statistics and IOM recommended the adoption of standard basic terminology for electronic health records (example: ICD9 as a symbol for diseases or symptoms, CBT4 for medical procedures and services, and Rxnorm for drug names and dosages). Significant developments are also under way to standardize event classification (example: reporting of side effects or near misses using the SNOMED CT classification developed by the College of American Pathologists) and expression of knowledge representation such as Clinical Practice Guidelines.

Among the advantages of applying electronic health records, we find:

- Improving health care services by facilitating the movement of patients between health care service providers, reducing redundancy, and reducing the time required for registration.
- Collect anonymized data at the macro level and gain data-driven insights (big data, machine learning, analytics), which can help in various aspects of public health such as preventing infection, understanding genetic factors, predicting and controlling disease outbreaks, planning availability and capacity, and enforcing adoption Best practices, new drug research, and even avoiding medical insurance scams.

7. Conclusion:

Electronic health records are the result of important information technology applications, and they have become one of the prominent pillars in the management of the health sector in all countries of the world. This study aimed to demonstrate the importance of using the electronic health record, especially in light of the rapid changes in modern technologies that the world is witnessing and the information and communication technology revolution over the past few years, and the radical changes imposed by the latter in many aspects of life and at a high pace, as it worked to bring the distance in a way that man has not known before; This is evident in the widespread spread of digital health through diagnostic technology and telemedicine, storing and processing all patient information and transmitting its data at high speed through information networks and modern means of communication. All this helped to provide information of utmost importance to decision makers, and helped to improve the quality of health services, as digital health through electronic health records has become a strategic dimension and is considered a tool for building and restructuring the forms of health institutions.

Recommendations:

Through the results obtained, we can suggest the following recommendations:

- Establishing a central database and electronic platform linked directly with data centers in hospitals and the public and private healthcare sector;

- The need for the state to ensure, through its health institutions, everything that is electronic health, especially in light of the rapid changes in information and communication technology and modern technologies that the world is witnessing;
- Encouraging health institutions in the private sector to use the electronic health record by clarifying the expected benefit from its use;
- Preparing awareness programs for employees in the health sector, as well as patients, on the importance of using electronic health records, in order to save effort, time and cost;
- Enhancing the level of knowledge of the employees by conducting training courses to acquire skills in computer applications and the electronic health record.

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